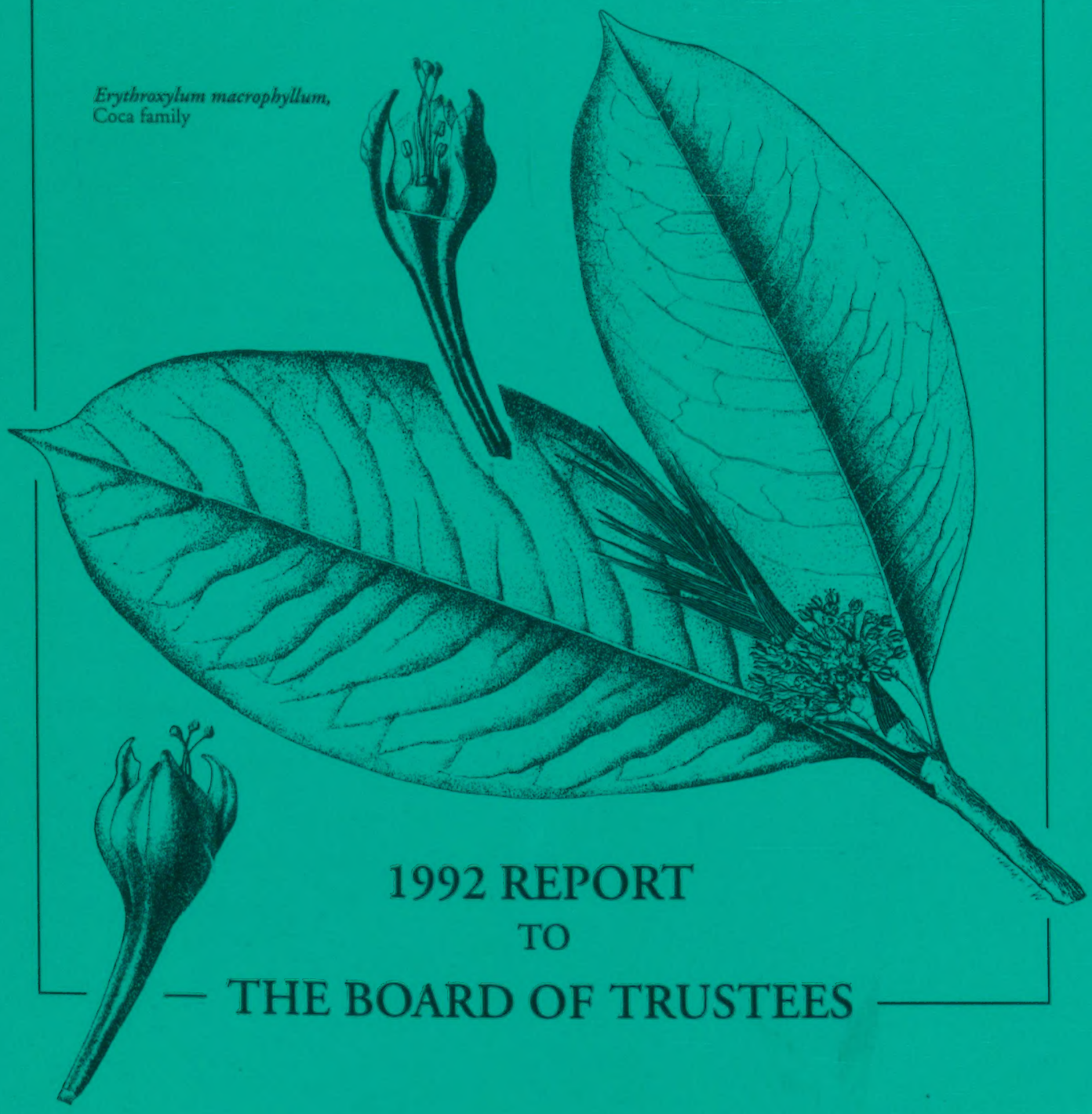
FIELD MUSEUM OF NATURAL HISTORY

CENTERS FOR
CULTURAL UNDERSTANDING AND CHANGE
AND
EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY



Erythroxylum macrophyllum,
Coca family

1992 REPORT
TO
THE BOARD OF TRUSTEES

FIELD MUSEUM OF NATURAL HISTORY

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY (CEEB)

1992

Annual Report to the Board of Trustees

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April 12th, 1993

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

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THE CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

- WORK IN PROGRESS -

Peter R. Crane

Vice President, Center for Evolutionary and Environmental Biology
and
MacArthur Curator, Fossil Plants

The 1992 Annual Report gives us the opportunity to reflect on the accomplishments of the last year, but as we approach the beginning of our Centennial it also reminds us that the achievements of our first century are already part of history. The challenge now is to develop a vision that will carry us into the future. When our Founders organized the Columbian Museum in August of 1893, the population of the City of Chicago stood at about one and a half million. In the ensuing one hundred years that number has almost doubled and we now stand at the center of a vast conurbation that is home to more than 8 million people. Over the last century, the changes in this city have been matched by even more striking changes in the world around us. The population of the planet has swollen from 1.5 to 5.5 billion and our demands on the Earth, its biological systems, and its life support mechanisms have continued to escalate. Rapid societal and technological change has been the dominant theme of the twentieth century. As the pace of change continues to quicken, our Museum is continually challenged to evolve and adapt -- to stay in touch with the realities of an ever-changing social, political and economic milieu, and also to maintain its position at the forefront of research and public learning. These realities, together with our aspirations to be the best and to make a difference in the world and in this city, continue to stretch our financial resources. But at the same time they offer new opportunities if we resolve to use our Centennial to look outward and focus on the future.

In the natural world, the engine of evolution is random change, but the evolution of a great institution must proceed instead along a course deliberately charted with a clear knowledge of our strengths and a clear understanding of where we want to go. For almost a year the Field Museum has engaged in an ongoing program of strategic planning to crystallize our vision for the future. As a first step we are working with a revised Mission Statement that emphasizes our commitment to public service and education in the broadest sense. This statement positions the Field Museum as "an educational institution concerned with the diversity and relationships in nature and among cultures"...that...."provides collection-based research and learning for greater public understanding and appreciation of the world in which we live."

Our subject matter can be summed-up in a single phrase, that for many of us encapsulates better than any other what this institution has been, and should be, about -- "Living Together on the Living Earth." To focus our efforts around these two themes we therefore created during 1992 two interdisciplinary centers: the Center for Cultural Understanding and Change (CCUC) under the leadership of Jonathan Haas, and the Center for Evolutionary and Environmental Biology (CEEB) led by myself. These Centers cut across the four academic departments of Anthropology, Botany, Geology, and Zoology, to provide the unifying intellectual curriculum for all Museum programs ranging from graduate to pre-school education and from cutting-edge research to exhibits. This brief report focusses on the Center for Evolutionary and Environmental Biology (CEEB) -- where it stands and what it is attempting to accomplish. Specifically it addresses three over-arching questions that we continue to pursue in our strategic planning -- what is the empirical and intellectual focus of the Center? What is the relevance of the Center's activities to current societal concerns? What is the prospectus for the future of the Center?

What is the empirical and intellectual focus of CEEB?

The Center for Evolutionary and Environmental Biology exists to document, understand and communicate the evolution and changing status of the Earth's biological diversity, as well as its interactions with global environmental processes both now and in the past. Basically we are concerned with the variety of life -- past and present -- and the changing nature of its interplay with other environmental factors.

The elegant and diverse interactions between organisms, and between organisms and their environment, have been a primary focus of evolutionary biology since Darwin, but one of the fundamental scientific advances of the late twentieth century has been to develop a still more holistic view of the intimate interconnections that exist between processes in the biosphere, geosphere, atmosphere -- and even planetary factors such as variations in the Earth's orbit or solar energy output. For example, the oxygen in our atmosphere is almost exclusively the result of biological activity (photosynthesis), which releases oxygen as a by-product of the process by which the Sun's energy is harnessed as sugars. Similarly, in even the most simple representation of the carbon cycle, there are many linkages that exist between geological factors on the one hand, such as burial of limestones, and biological processes on the other, such as photosynthesis and respiration. Volcanoes for example, release large quantities of carbon dioxide and other materials into the atmosphere, while both marine and terrestrial plants "draw down" the carbon dioxide and prevent the accumulation of CO_2. The relative rates at which these and other processes operate ultimately determine the amount of carbon dioxide in the atmosphere, and thus influence whether a global "greenhouse" or "icehouse" climate results.

These simple examples lead us to two important points. First, the central theme of modern research in environmental science is interconnectedness -- that is, complex interactions occur in ecosystems at all scales between biotic, geologic, climatic and many other factors. Second, the Earth's biota is a central, not peripheral, participant in these processes.

In this context, the curriculum of any academic enterprise in evolutionary, ecological or environmental biology is fundamentally interdisciplinary, and therefore three pragmatic objectives of the Center for Evolutionary and Environmental Biology are, i) to encourage our botanists, geologists and zoologists to work together more effectively as a team in their research and collection activities, ii) to pursue interdisciplinary research approaches where appropriate both inside and outside the Museum; and iii) to repeatedly emphasize, in all aspects of the Museum's programs in public learning, the importance of the interconnections that exist within the biosphere, and between the biosphere and other aspects of the natural world.

These three objectives are intellectually defensible, but are also realistic and strategic. Environmental concerns are some of the most pressing societal issues at the close of the 20th century and our existing strengths in botany, geology and zoology, give us greater disciplinary breadth than many of our peer institutions with which to make important contributions in these areas. This disciplinary breadth is something on which we need to capitalize. Furthermore, because the Field Museum is the smallest of the world's four largest Natural History Museums, in operating budget, collections and curatorial staff, a successful future strategy requires that we devise new approaches in which "more" is not the sole criterion for success. In a time of increasing costs and shrinking financial resources it is neither wise nor feasible to contemplate major expansion.

In recognizing these realities we are in good company, "what we need to do" as the President of Harvard University recently stated in the New York Times "is to figure out how to get more out of what we have got, how to coalesce more, rather than to add." Interestingly, Harvard has also identified a small number of themes around which to focus their efforts in teaching and research. In academia, where professors have traditionally pursued their own interests, this is a revolutionary proposition. For us it is less radical because during the last decade of high curatorial turnover we have not only recruited an academically excellent faculty, but one which works together well as a team, and is also keen to do whatever is

necessary to advance the overall goals of this institution. Already, in our scientific programs the whole is greater than the sum of the parts, but we need to strengthen these linkages, and to extend them to other areas of the Museum.

In many respects the Center for Evolutionary and Environmental Biology is directly comparable to a Department of Ecology and Evolution, such as exists at many major universities. In my experience, however, it is rare that such departments function as effectively as a single unit as we are beginning to function in CEEB. CEEB also differs in three other important respects from a typical university department, i) we have important responsibilities as stewards of the vast collections that we hold for the use of others; ii) collections play a central role in our own Museum-based programs; and iii) we face greater challenges because of the diverse age and background of the audience that we seek to inspire and educate -- which I see is as much the responsibility of our scientific staff, as of our colleagues in public programs.

In short, the career of a typical university science professor will leave two important legacies; a body of original research and intellectual progeny -- students of various kinds. The legacy of a curatorial career is original research, original research conducted by others using the collections, and much more diverse intellectual progeny that includes the public as well as undergraduate and graduate students. Given the currently rapid loss of biological diversity in many parts of the world and the urgent need for science education at all levels, it is clear that the collections and students, as much as the research published, will be enduring contributions, of this generation of curators.

Our collections of more than 20 million specimens therefore provide the empirical focus of the Center for Evolutionary and Environmental Biology. These collections are vital to the activities of the Center and they stand at the heart of the Field Museum. We are one of only a handful of institutions internationally, where you can sample such a broad range of past and present plant and animal diversity under a single roof. In the U.S. the only facility with collections of comparable breadth and quality is the Smithsonian. The Field Museum collections are a unique international resource, of enormous value, that complement but do not duplicate other collections elsewhere in the world. Our bird collections for example are smaller than those at the American Museum, but curators from New York still come to Chicago because the two sets of holdings are complementary not duplicative. In a typical year we loan 50 to 60,000 specimens to scientists at other institutions and receive about a thousand visitors. One measure of the significance of our collections is that over the last seven years we have received 2.8 million dollars from the National Science Foundation for special projects to make the specimens in CEEB more useful and accessible to scholars from all around the world.

In Botany our collections began with the economically important plants from the Columbian exposition, and our world class botanical collections from tropical Central and South America were initiated through expeditions to Yucatan and Caribbean by Charles F. Millspaugh between 1894-1907. Overall the botanical holdings in the Department of Botany now comprise approximately 2.5 million specimens ranging from microscopic algae to palms, and parts of these collections are currently being moved to a new completed lightwell collections facility.

In Geology our collections total about 600,000 specimens, the bulk of which are plant and animal fossils, and include the important collections from the University of Chicago, Walker Museum of Paleontology, which were incorporated with those of the Field Museum in 1965. We also house one of the world's finest collections of meteorites -- the best sample that we are likely to have in our lifetime of rocks from elsewhere in the solar system.

In Zoology our collections of animals from all over the world are vast. The two and a half million birds, reptiles, amphibians, mammals and fishes together provide one of the most comprehensive and most used collections of vertebrate animals anywhere. And among almost 14 million invertebrates we house vast collections of insects that mirror their status as the most diverse group of organisms on this planet.

Elsewhere in this report you will find a summary of the size of the biological and geological collections in CEEB, but the important thing to realize is that they are unique and in almost every case rank among the top five in the nation.

Our Mission Statement recognizes that our collections are inseparably linked to programs in public learning and research. These collections fuel our research, and I am also convinced that we are most effective in public learning when our collections and research together provide the intellectual underpinnings of our efforts in education and exhibits. When we do not utilize our collections, we relinquish our most distinctive attribute and surrender our greatest strength. Without collections our research ceases to be qualitatively different from that at major universities, and our exhibit and educational programs no longer stand apart from those at any number of science and nature centers around the country. Similarly, without research the collections lose their relevance. The collections are only as good as the ideas that flow from them. Specimens need to be activated by intellectual effort so as to communicate important ideas or answer significant questions.

Our collections, and those of the other great natural history museums, are the primary resources for documenting, understanding and communicating about, the past and present biological diversity of our planet. This, in turn, dictates the central component in all our curatorial research programs, which focuses on that area of biology known as systematics -- the science of biological diversity.

Systematics is both the oldest, and the most general of all biological subdisciplines. It is fundamentally synthetic, integrating information from all other areas of biology to understand the relationships among living and fossil organisms. What it provides in return is a comparative framework for biological research -- effectively a map of past and present biodiversity, and the standardized reference system of names that is essential for communication about different organisms throughout biology. Without systematics all comparative biological studies would be scientifically suspect, and communication in biology (and its attendant applied sciences of agriculture, horticulture and medicine) would be in chaos.

The nature of their subject matter dictates that systematists are broadly trained; ideally to study form, function, ecology, development and molecular biology. Good systematists are also good all around biologists. In the Center for Evolutionary and Environmental Biology we have more than 35 PhD's and more than 80 other staff who build and curate the collections, and conduct systematic research. I cannot emphasize enough the quality and dedication of all of my 100 plus colleagues in CEEB. Indeed, one of the recurrent problems that we face is retaining our staff in the face of repeated "poaching" from major universities. One measure of the strength of our scientific staff is their success in securing research funds from the National Science Foundation and other sources in an increasingly competitive environment. In the last four years the CEEB departments have received 24 multi-year research grants at a success rate of over 50%. This is a record that many university departments would wish to emulate.

Most recently we have received two large awards from the National Science Foundation to enhance our facilities for paleontological and biochemical research. In 1991, through the efforts of John Bolt, John Flynn and Bill Simpson, the Department of Geology received one of 78 awards in a total competition of 425 institutions nationwide. This was the only grant to awarded in the State of Illinois, and this renovation allowed us to transform our previously cluttered and dated facilities into a modern, state-of-the-science suite of paleontological laboratories. These new facilities, which include a magnetically-shielded room for paleomagnetic analyses, not only improve the working conditions for our staff, but also complement those available at nearby institutions and thereby provide improved facilities for teaching and training -- and also for our visitors.

Recently, we have learnt that through the efforts of John Hall and Scott Lanyon we will receive additional support from the same National Science Foundation program that will produce a similar transformation in our molecular biology- biochemistry laboratories.

Our collections and staff combined therefore make the Field Museum one of the premier centers for specimen-based biological research in the world, and we are in the forefront of applying new techniques to the study of museum material. Together with colleagues at the University of Chicago and the University of Illinois at Chicago, we are part of a community of scholars that is recognized internationally as one of the most influential groups in modern evolutionary biology. We must continue to retain our important position in this group, however, recognizing our responsibilities as public servants, we must also continue to think seriously about our role in contributing to the resolution of societal problems. We must also realize that from time to time this will involve setting Center-wide goals that displace individual curatorial research and collection objectives.

What is the relevance of our activities to current societal concerns ?

With our focus in specimens, biological diversity and systematics what are the distinctive contributions that we are positioned to make in modern biology and society at large? From my current perspective three areas standout, but others may emerge as our planning continues, **i) environmental biology** -- because of our interdisciplinary capabilities , **ii) plant and animal development and biotechnology** -- because of our unique insights on the diversity of life, and **iii) science literacy** -- because of the intrinsic advantages that biological sciences, and field and specimen-based studies in particular, offer for inspiring and energizing the public, teachers and students about science.

Environmental Biology

Unquestionably one of the greatest environmental issues of the twentieth century concerns habitat destruction and the consequent disappearance of species worldwide. Much popular literature in this area is misleading, but it is undisputable that current rates of species extinction, particularly in tropical regions, rival those of the most catastrophic in earth history. It has been estimated that fewer than 1500 scientists worldwide are trained and equipped to inventory tropical diversity.

In addition to strong ethical and theoretical arguments for conservation, governments and the public worldwide are recognizing increasingly the importance of protecting natural habitats and the biological diversity that they support. Direct benefits include significant income through eco-tourism, development of new pharmaceutical products, maintenance of genetic resources and, perhaps most important, protection of vital watershed areas that provide the water for domestic consumption, agriculture and industry. Unfortunately, with current trends, habitat destruction may eliminate the source of these benefits before most can be realized. It is clear that the next one or two decades will determine whether future generations in many parts of the world live in a balanced, sustainable environment, or enter into a phase of accelerating extinction, declining resources, declining environmental stability and declining human prospects.

For nearly a century the Field Museum Departments of Botany and Zoology have inventoried and described global tropical diversity. Encyclopedic collections, extensive libraries, and a renowned community of scholars with strong university ties have allowed the Museum to assume a leading role in biodiversity studies. Traditionally staff activities led to enormous collections and major treatises, such as the landmark volumes Living New World Monkeys, Frogs of Sabah, and the 7,500 pages of the Flora of Guatemala completed almost entirely here at the Field. This important work still continues and must be supported, but increasingly the activities of the staff of botany and zoology are focusing ever more directly on the conservation and sustainable use of tropical diversity. Currently, we are partners with the National Science Foundation, National Geographic Society, the U.S. Agency for International Development and the MacArthur Foundation in this work which is proceeding at four interrelated levels.

First, because we are still substantially ignorant of biotic diversity in the tropics and its potential uses we are continuing to amass key collections and to compile basic biotic inventory data. The only way that society and governments can make informed decisions about conservation and use of natural areas is to have scientifically accurate information about the origin, diversity and ecological relationships of the indigenous biota. Scientific collecting and basic systematics are key components in this enterprise and often relate directly to the practical use of these resources. For example, two of our Research Associates are also involved in pharmacological prospecting to identify useful medicinal plants in tropical ecosystems. Steve Goodman and Abdul Ghafoor recently recorded the uses of local plants in travelling the back roads and bazaars of Southern Pakistan -- and documented their observations by depositing specimens in the Botany Department herbarium. Similarly, Research Associate Doel Soejarto is funded by the National Cancer Institute to prospect for anticancer anti-AIDS agents in cooperation with governments in south-east Asia. Again, these specimens are identified and vouchered in our herbarium.

At a second level, several of our staff are actively engaged in focussed research projects to understand how habitat disturbance impacts natural communities, which areas should be prioritized for conservation, and how this should be achieved. Also, in many cases our botanical and zoological collections provide the documentation of the biological effects of changing patterns of land use. As an example, Bob Inger and Harold Voris have been supported by the MacArthur Foundation over the last few years to estimate the effect of different logging strategies on communities of rainforest frogs in Borneo. The aim of this work is to understand the effects of habitat disturbance, and also the vulnerability of different phases in the amphibian life cycle so as to guide conservation decisions. Similarly, Larry Heaney has been engaged in a long-term project in collaboration with colleagues in the Philippines to identify areas of endemism and genetic variability and to feed these data into developing a country-wide strategy for establishing biotic reserves. Mike Dillon is also active in this area and will shortly be a major contributor to a conference in northern Peru on biodiversity and development to which we have been able to provide modest support through our "Coins for Conservation" program started by Jonathan Haas and Nancy Walsh.

At the third level, others on our staff are focussing on the theoretical issues that underlie conservation strategies. Bruce Patterson has been engaged in theoretical studies on the design of nature reserves that have broad applicability not only in the tropics but also here in the U.S. Bruce's conclusions have helped to reverse the previously accepted wisdom that large numbers of small reserves are the most effective for conservation purposes. What Bruce showed is that because of the nested hierarchical properties of the ways in which species are distributed, given finite resources a few large reserves are much more effective than a larger number of smaller reserves in terms of the diversity of animal and plant species that it will protect.

The fourth, and perhaps most crucial component of our environmental programs is the provision for training scientists and managers in the countries where the threats to the environment in general, and to biological diversity in particular, are most acute. This is an increasing focus of our work because it is obvious that the ultimate solutions, to environmental problems are shared solutions involving the people of both developed and developing countries. It is crucial that reliance on scientists and managers from developed countries is reduced. In the long run it must be the inhabitants of the tropical countries, and not outsiders, who best can preserve and utilize their vital, natural resources.

For this reason, in collaboration with Chicago Zoological Society and the University of Illinois at Chicago, CEEB has proposed a collaborative program of advanced intensive training in conservation biology to increase the capacity of people in tropical countries to deal with the critical issues involved in the conservation of their natural resources. This program, builds on a project funded by the MacArthur Foundation in the Philippines over the last three years that targets people who are already employed in positions that will allow them to quickly implement new programs and translate their new knowledge into action. These educational investments accrue snowballing benefits as our students and trainees themselves begin to train new generations of scientists.

Developmental Biology and Biotechnology

A second important area in which I see Field Museum scientists making an important contributions is in developmental biology and biotechnology. Over the last few decades research in much of biology has adopted a reductionist approach focussing on a small number of experimental or so-called "Model Organisms" to attempt to understand how plants, animals and microbial organisms grow and function. Usually these organisms such as the fruit fly Drosophila, the small weed Arabidopsis and bacterium Escherichia coli are chosen for their experimental tractability rather than their qualities as representatives of organismal diversity. One question is, to what extent are the developmental processes discovered and understood, in these organisms capable of explaining the enormous diversity of form that we see among living and fossil organisms? Another, is whether desirable characteristics discovered in one organism (e.g., disease resistance in plants) can be genetically transferred to another.

Olivier Rieppel, for example, is integrating information on bone formation in modern turtle, alligator and lizard embryos, as well as information from extinct reptiles to understand how the vertebrate limb is formed. His results raise questions about some of the general models proposed for the evolution of vertebrate limb development. Similarly Lance Grande and Research Associate William Bemis are working on the development of primitive fishes from embryos to adults, including how organ systems such as bones, teeth, brain and sensory organs are formed.

In botany, there is now great interest in genetically engineering plants to improve their resistance to disease, increase their tolerance to drought, and to improve their commercial attributes (e.g., larger flower size in horticulture, improved yield in agriculture). In the past, systematists have contributed to achieving these kinds of improvements through their role in plant breeding programs. This will continue, but recent developments in biotechnology now open-up still greater possibilities for genetic engineering and these too require the input of systematic expertise. Mike Dillon, for example, is actively involved in a international biotechnology research group examining the evolution of specific chemicals (osmoprotectants) that impart increased resistance to arid or saline conditions. The ultimate objective is to identify the genes controlling the synthesis of these compounds with a view to their transfer to appropriate agriculturally significant species.

These and other developmental biology/biotechnology research projects currently underway in CEEB place the Field Museum in some of the most exciting and rapidly moving subfields in modern biology.

Science Literacy

The third and final area in which we are already making important contributions, and in which we must intensify our efforts, is in improving science literacy within the U.S. and especially in our local communities. Unlike the situation at many of our peer institutions almost all of our curators teach courses, either at the University of Illinois at Chicago, or at the University of Chicago. This has traditionally been, and continues to be, a crucial mechanism for maintaining the intellectual vitality of this institution. Teaching helps us communicate the importance of what we do, maintains the long-term viability of curatorial careers, and allows us to benefit from the natural intellectual stimulation that students supply. Our contributions also benefit the universities in providing their students with broader exposure to modern biology and access to resources in biological diversity that are unavailable elsewhere.

Recently, however, we have sought to expand our educational efforts through internship programs. Last summer we supplemented our own limited funds with additional grants from the National Science Foundation and the Illinois Board of Higher Education, and hosted 32 culturally diverse undergraduate students for a program that involved biweekly lecture sessions, discussions with scientists from various departments, as well as hands-on work in research and with the collections.

Elizabeth Pine, who has worked here at the Field Museum as a high school intern with Greg Mueller in our Botany Department is one success story of the internship program. Last month she won the Westinghouse Science Talent Search, the nations' most prestigious science fair, out of a total of 1,600 high school seniors nation-wide. Elizabeth gains a $40,000 scholarship and goes up to Harvard in the fall after another summer of research here at the Museum.

All of us in CEEB also have a special responsibility to the people of Chicago. More than two thirds of Chicago public school students come from low income families, the second highest level in the nation. Only 52% of all Chicago public high school students enroll in science classes and among 11th graders taking the test of Achievement and Proficiency 41% scored in the bottom quarter on the science section. Natural history provides one of the most effective means of introducing and motivating some of these students to science, and has other advantages in terms of its inherently interdisciplinary focus and its relevance to a plethora of currently important issues including habitat destruction, global warming, ozone depletion, disease and pest control, etc. To address this need, in partnership with the Museum's Department of Education, CEEB submitted a proposal to the Howard Hughes Medical Institute to involve 28 Chicago school teachers in intensive, graduate-level studies to improve their scientific literacy and knowledge of biology, enhance their teaching skills, and generally raise their level of enthusiasm for biological sciences. This program would directly benefit 2,500 students and we estimate that it could touch 9-10 thousand students over a five year period.

Prospectus

Fundamentally, I believe that our Centenary unquestionably finds the Center for Evolutionary and Environmental Biology in a strong position. On a "pound for pound" basis I believe that we are as strong or stronger than our national and international peers. We have benefitted from sound and experienced leadership, and have an excellent, versatile and opportunistic staff. We have good facilities, both to house our magnificent collections and also to expedite our research. Our library and other support services are world class. However, we clearly face significant challenges. From my perspective, in CEEB and in the Museum as a whole, a clear recognition of responsibilities as public servants is vital to meeting these challenges, and fundamental to achieving our goals. Only if we are successful in this area can we expect to sustain and hopefully, increase the support for our activities. We need to constantly look outward to determine how we can be even more effective in serving our many publics ranging from children, to adults, and families to the national and international research communities.

I believe that we need to continue to judiciously expand our collections, particularly in tropical regions where we have a rapidly closing window of opportunity for sampling, and where these data are especially vital to future planning about the conservation and use of natural resources. Because of the rate of habitat destruction and because of growing ecological interest it also seems likely some methods of sampling will change. In particular, we will probably take more bulk ecological samples from specific habitats, such as the soil and forest canopy. We also need to make our collections more accessible for use through increased computerization, and it will only be a matter of time until visitors and specialists alike will be able to browse many of our collections in the form of computerized images.

In research we must maintain our position at the heart of one of the most influential groups of evolutionary biologists in the world. Our credibility in all our endeavors derives ultimately from our credibility as top-quality scientists. However, I also see us making important interdisciplinary contributions in other areas including global change research, geochronology, and perhaps planetary science, that emphasize the extent to which we recognize the interconnectedness of biological and geological processes. I also predict that developmental biology and other interfaces with biotechnology will become an increasing focus of our research efforts.

We will do more training of biologists and natural resource managers from other areas of the world, we will be increasingly involved in defining and inventorying biotic reserves, and we will interface more regularly with development agencies to develop the physical and human capabilities in other countries so they can use and manage their own resources.

Closer to home, the Center for Evolutionary and Environmental Biology will have a more overt focus on improving scientific literacy in general, but especially in our subject area. We must look for new ways to reach a broader city-based audience and ensure that our exhibit and educational programs are themed around the kinds of issues in which CEEB is involved. If we are to succeed in the coming decades we need to leave no doubt in peoples' minds when they visit the public Museum that this institution is intimately concerned with biological diversity and environmental issues. We need to be a clearing-house for accurate information on these questions. To help us interface with our specialists and experts in Education and Exhibition I see the development of a cadre of "paracurators" that have direct experience of research and collection activities, but that are supported by special project funds, to facilitate and coordinate the interactions between CEEB and the Public Museum.

I hope that it is obvious from this report that I am enthusiastic about the future of CEEB and I believe that it is central to what this Museum must do in the coming years. However, it is self-evident that CEEB cannot function in isolation. The stability and functionality of ecosystems depends on the interactions between its components. Similarly, the stability and success of this Museum hinges on how effectively the different administrative units are interconnected and can work together to make good things happen and to achieve institutional goals. We must continually look for ways in which the Center for Evolutionary and Environmental Biology can interact with the Center for Cultural Understanding and Change and at the same time both Centers must look for new ways to contribute to public learning. Our twin themes are of major societal significance. If we can coalesce around them as an institution, and translate them in a lively, educational and entertaining manner, then we will enter our second century poised for still greater success.

– SYSTEMATICS –

THE SCIENCE OF PAST AND PRESENT BIOLOGICAL DIVERSITY

"You ask what is the use of classification, arrangement, systematization? I answer you: order and simplification are the first steps toward mastery of a subject - the actual enemy is the unknown."

Thomas Mann, "The Magic Mountain" (1924)

Systematics is both the oldest, and the most general of all biological subdisciplines. It is fundamentally synthetic, integrating information from all other areas of biology to understand the relationships among living and fossil organisms. In return it provides a comparative framework for biological research -- a map of past and present biodiversity -- and the standardized reference system of names that is essential for communication about different organisms throughout biology. Without systematics all comparative biological studies would be scientifically suspect, and communication in biology (and its attendant applied sciences of agriculture, horticulture and medicine) would be in chaos.

Because scientists must always accurately specify the identity of their study organism, systematics is the most pervasive of all branches of biology. However, over the past 50 years its intellectual stature has declined, particularly in the face of rapid developments in cellular and molecular biology. Nevertheless, in the last decade, systematics has undergone a renaissance initiated by a theoretical and methodological revolution that has substantially improved its rigor, and that has dealt effectively with several significant philosophical issues that had formerly blocked progress. In parallel with these advances, there has been the development of increasingly sophisticated computer software for rapid numerical analyses of large or complex data sets, and developments in molecular biology that allow amplification and sequencing of RNA and DNA across a variety of organisms. Taken together, these advances have improved the integration of systematics with modern evolutionary biology and ecology, have attracted a new generation of scholars into the field, and have reoriented the perception of systematics within biology as a whole. Systematics is now a dynamic and rapidly changing science dedicated to exploring the patterns and processes underlying similarities and differences among organisms. Modern systematists view the world's biotic diversity as sets of historically inter-related species. There is a single genealogy by which all species, living and extinct, are interconnected. It is the job of the systematist to reconstruct that pattern of relationship: the phylogeny. This knowledge provides the foundation upon which much of biology is built.

The demand for systematic expertise is now greater than at anytime in the last 50 years. Not only are systematists in the front-line of crucial environmental concerns, but the schism between molecular and organismal biology is closing rapidly as scientists from both areas come together to understand how molecular- level processes are generated in biological diversity. Throughout Field Museum's history, the scientific staff has been actively engaged in systematic research and the institution has maintained the collections which make possible the research conducted by scientists around the world. This institution is recognized internationally as a leader in the theory of systematic biology, and has world-class systematic biologists working on amphibians, birds, bryozoans, cryptogams, fishes, flowering plants, fungi, insects, mammals, marine snails, mites, octopods, reptiles. The organisms studied by these researchers span the globe biogeographically and the last billion years temporally. These research efforts are supported by Field Museum's extensive scientific collections, the library, the scanning electron microscope facility, the computing center, the biochemistry laboratories, the histology laboratory, the functional morphology laboratory, the paleomagnetics laboratory, and the tissue culture laboratory. Research in systematics is basic to the work of almost all our curatorial faculty, as well as the interdisciplinary programs described in the pages that follow.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

CONSERVATION BIOLOGY

Unquestionably, one of the greatest environmental issues of the 20th Century concerns the rapid disappearance of species worldwide. Current rates of species extinction rival those of the most catastrophic episodes in Earth's 4 billion-year history. Species loss is particularly great in tropical regions--although tropical moist forest habitats cover scarcely 6% of the world's land surface, they support about half of all plant and animal species. Many remain undiscovered and undescribed, and we remain ignorant of their roles in natural communities or their potential uses as crops or pharmaceutical products. Fewer than 1500 scientists worldwide are trained and equipped to inventory tropical diversity. Currently, less than 1% of the world's fauna and flora is under scientific study.

For nearly a century, Field Museum's departments of Botany and Zoology have inventoried and described global tropical diversity. Encyclopedic collections, extensive libraries, a renowned community of scholars, and strong university ties have allowed the museum to assume a leading role in biodiversity issues. Traditionally, staff activities led to enormous collections and monographic treatises, such as the continuing series Flora of Costa Rica and Flora of Peru or the landmark volumes Living New World Monkeys (Platyrrhini) and The Frogs of Sabah. Increasingly, however, the activities of almost 20 curators and dozens of Research Associates focus directly on conservation of tropical diversity.

The impact of Field Museum programs on conservation biology is immediate and extensive. Field Museum botanical and zoological collections document historical range changes and population trends; the collections are also used to identify prospective location of future parks and reserves. Museum curators, often in multi-disciplinary collaboration, frequently produce the first inventory of species inhabiting tropical parks and are uniquely qualified to formulate species management recommendations. Museum scientists are also reshaping the conceptual framework of conservation biology, broadening the scope of a discipline rooted in the temperate zone with hard-won data from tropical ecosystems. On-going research at Field Museum is extending the theoretical foundations of conservation biology, from a classical focus on species richness (how many species are present) to include both species composition (which species are present) and evolutionary distinctiveness (how distinctive are species from forms found elsewhere). At present, the National Science Foundation, National Geographic Society, Conservation International, Agency for International Development, and the MacArthur Foundation are all partners in this work, which has also received past support from the Fulbright Foundation.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

TRAINING IN SYSTEMATICS AND BIODIVERSITY STUDIES

The crisis of biodiversity loss comes on the heels of several decades in which universities emphasized molecular and cellular biology at the expense of organismal biology and thus presents a serious challenge. Just when the need for trained field biologists to discover, document, and interpret biological diversity is highest there is a severe shortage of adequately trained professionals. However, while most universities were divesting themselves of field trained biologists, free-standing natural history museums maintained and encouraged this expertise. Now universities and government are turning to these institutions for help. If the United States is to produce the well-trained college graduates required to deal with many of the biological problems that face our society today, the free-standing museums will have to play a major role.

The Field Museum of Natural History has embraced this role with enthusiasm. Almost all Field Museum scientists hold joint teaching appointments at degree granting institutions. Staff teach more than a dozen undergraduate courses and graduate courses annually. At present about 50 graduate students have FMNH staff as members of their graduate advisory committees. Each year two to five postdoctoral fellows are in residence broadening the training they received as graduated students. More than 30 undergraduate and high-school interns participate in CEEB programs annually.

CEEB involvement in formal education is extensive but that represents only a portion of our educational effort. Recently, CEEB has proposed a program aimed at providing junior high school science teachers with additional science training. Our goal is to improve their ability to communicate facts and concepts to their pupils and, more importantly, to improve their ability to excite students about the natural sciences and encourage them to consider a career in the sciences.

One of the most active facets of current educational programs in CEEB are our increasing efforts to train scientists from tropical countries so as to reduce reliance on outsiders in assessing and managing their biodiversity resources. A training program for philippine scientists is already in existence and funding is being sought to establish a more ambitious training program, in conjunction with University of Illinois at Chicago and with Brookfield Zoo, which will involve professionals and students from tropical countries all over the world. Field Museum already supplements its efforts in this area through scholarship funds that are used primarily to encourage students and foreign scientists to visit FMNH, use our collections, and collaborate with the staff.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

BIODIVERSITY INFORMATION RESOURCES

Computerization now pervades all aspects of modern science, and has had a revolutionary impact in the area of environmental and evolutionary biology. The development of high capacity, inexpensive computers and more sophisticated, user-friendly software have allowed for unprecedented electronic data capture, storage, analysis and retrieval. Systematists traditionally collect, analyze, summarize, and communicate information from autonomous institutions, using specimens as single-item samples of biodiversity. This approach will always be needed, but large collections are of still greater value to both scientists and society when their contents are computerized, thus allowing larger-scale questions to be addressed.

Many of the Field Museum's 20 million specimens are catalogued in computerized form. Our botanical, geological, and zoological databases include such data as hierarchical classifications, geographic distributions, ecology, and physical or chemical composition. This information is readily available to researchers within the Museum, however, computer networking is rapidly expanding access to these information resources, which are becoming available to scientists from thousands of computers world-wide. Using our own data in combination with that of others we are now able to ask questions that a few years ago were incalculable, or too large to make calculation worthwhile given limited human or computer resources. Information from only one institution is typically inadequate to answer complex questions concerning global distribution patterns or changing species frequencies thereby making the access to ever growing electronic data from other institutions a necessity. Networking systems that allow access to museums collections and biological libraries throughout the world will be crucial to future research and policy decisions in environmental biology. Researchers with network-connected computers can communicate through electronic mail and it is increasingly routine to send data around the globe in minutes. Most computer data currently available is textual or numeric; however, the future will see the expanded ability of computers to capture, transmit, and store graphic information. Soon, digitized color images of plants, animals, fossils, maps, and illustrations residing in remote sites will be routinely available over networks and easily coupled with more traditional computer information. The development of geographical information systems will continue to integrate data from many disciplines into dynamic maps necessary to address research priorities such as the biodiversity crisis and global climate change.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

GEOCHRONOLOGY RESEARCH

The accurate subdivision and calibration of geologic time is crucially important in geological exploration, and central to many areas of pure and applied research in modern geology and environmental biology. Traditionally, sequential changes in the composition of fossil assemblages through time have been used to develop a relative chronology of the stratigraphic record (biostratigraphy). The rates of decay of radioactive isotopes in well-preserved minerals have then been used to provide a numerical calibration of "absolute" time (radiometric dating). However, the full potential of these techniques has been difficult to realize because the best biostratigraphic time scales have been developed in ancient ocean basins while the best radiometric dates come from rocks deposited on ancient land surfaces. In the last twenty years the development of magnetostratigraphy, using the history of reversals in the Earth's magnetic field to "tell time", has provided a means of fully integrating biostratigraphic, radiometric and other stratigraphic techniques, leading to major advances in establishing increasingly accurate and globally applicable geologic time scales.

For almost a century the world-class fossil collections at the Field Museum have been used extensively in defining and refining biostratigraphic standards, but current programs extend these historic strengths to integrate biostratigraphy, magnetostratigraphy and radioisotopic dating. The recent construction of a new laboratory for studies in paleomagnetics has made the Field Museum an internationally recognized center for geochronology. Research currently under way using the paleomagnetics facilities is: i) providing more secure and accurate age assignments for fossil bearing strata, ii) developing a refined globally applicable standard geologic time scale, iii) using geochronologic information to understand plate tectonics and the rate and timing of mountain building and basin formation (Rocky Mountain basins; Magdalena Basin, Colombia; Chilean Andes), and iv) reconstructing paleoenvironments in hydrocarbon-bearing sedimentary basins (western North America, Chile, Colombia). In 1985 a Field Museum geologist and two co-workers developed a standard geologic time scale for the past 66 million years, which is being used by the Geological Society of America as the time scale for its Decade of North American Geology Project. Current users of the Field Museum paleomagnetics facilities include students and faculty from the University of Chicago, Northwestern University, Rutgers University, University of North Carolina-Charlotte, Universidad Autonoma of Mexico City, Duke University and the State University of New York at Stony Brook.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

GLOBAL CHANGE RESEARCH

The diverse issues encompassed by the term "global change" (e.g., "greenhouse effect", ozone depletion, deforestation, declining freshwater resources) are among the most pressing societal concerns at the close of the 20th Century. Scientific investigation of these problems requires implementation of large-scale, interdisciplinary research strategies designed with the realization that hydrologic, sedimentological, climatic and geochemical systems are all profoundly affected by spatial and temporal changes in the Earth's biota. A central element of this new holistic research agenda is to look to the past as the key to understanding the complex biotic and environmental interactions that fuel the engines of global change. Thus, for the relatively recent past, examination of polar ice cores provides essential data on changing concentration of atmospheric carbon dioxide associated with advancing and retreating ice sheets, while knowledge of the more distant past provides insight into the interactions between the earth's surficial and climatic systems, the nature of the biosphere during former "greenhouse" intervals and an opportunity to test the predictive power of the numerical climate models that are being developed based on present-day information.

Paleontological collections at the Field Museum are a major international resource for elucidating the history of plant and animal life, providing baseline data from which the Earth's environmental history may be interpreted and testing hypotheses of future global change. In addition, research under way at the Field Museum is using the paleobotanical record to decipher vegetational and climatic changes through a critical phase of Earth history between approximately 140 - 65 myr BP (the Cretaceous Period). This interval witnessed a major modernization of terrestrial ecosystems and was also characterized by rapid rates of sea floor spreading, high levels of atmospheric carbon dioxide, massive emplacement of flood basalts and the evolutionary diversification of several different groups of plants and animals. Mid-Cretaceous marine rocks are also estimated to be the source of approximately 70% of the world's oil reserves. Field Museum curators are using the extensive published record of pollen grains and spores to reconstruct the marked vegetational changes that occurred through this interval, including the origin and diversification of flowering plants, the rise of modern groups of ferns and conifers, and the extinction of ancient plant groups. With these patterns established possible causal links to changes in Cretaceous global environments are now beginning to be addressed. In compiling these data Field Museum researchers are collaborating with colleagues from the University of Chicago and University of Queensland Australia, and have received support for pilot projects from the Petroleum Research Fund of the American Chemical Society.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

INTERDISCIPLINARY PROGRAMS

RESEARCH IN DEVELOPMENTAL BIOLOGY AND BIOTECHNOLOGY

Comparative developmental biology has moved into center stage of evolutionary studies. Neglected during the past decades of synthesis of evolutionary biology, developmental studies are likely to become one of the most important fields of research on the evolution of biodiversity on earth. Classical approaches to evolutionary biology, such as population studies, concentrate on the variability of traits and its genetic background, within and between reproducing communities of organisms, yet fail to account for the fact that it is not traits nor characters that are inherited, but the potential for their development during the ontogenesis of each organism. This means that every evolutionary change is reflected by a change in the sequence of developmental events, just as every change of developmental pathways causes an evolutionary change in the community of reproducing organisms. The comparative study of developmental pathways, and the inquiry into their underlying causes, therefore holds important keys to our understanding of the phylogenetic past. Changes of relative timing of the development of different organ systems have been recognized as a major mechanism of evolutionary change. Conversely, the study of the pattern and sequence of the development of characters provides important information for the reconstruction of evolutionary relationships.

Developmental studies at the Field Museum concentrate on skeleton formation in reptiles, in particular on the sequence and patterns of ossification processes. These investigations apply histological techniques of whole mount imaging to large series of embryos of all major reptile groups (turtles, crocodiles and lizards). Such studies provide important insights into "ontogenetic repatterning", that is the development of new patterns of structural relations as cartilage is being replaced by bone. Understanding of "ontogenetic repatterning" is crucial for the reconstruction of evolutionary relationships of reptiles (or any other organisms), but also provides the basis for a more detailed investigation of patterns of skeletal reductions in fossil and extant reptiles. Preliminary evidence suggests an influence of temperature and moisture during incubation on ossification processes. Skeletal reduction may also be induced by changes of habitat (for example: reduction of gravity in aquatic environments). The study skeleton formation is central to problems of skeletal biology as a whole.

In botany, there is now great interest in genetically engineering plants to improve their resistance to disease, increase their tolerance to drought, and to improve their commercial attributes (e.g., larger flower size in horticulture, improved yield in agriculture). In the past, systematists have contributed to achieving these kinds of improvements through their role in plant breeding programs. This will continue but recent developments in biotechnology now open-up still greater possibilities for genetic engineering and these too require the input of systematic expertise. One Field Museum botanist is actively involved in a international biotechnology research group examining the evolution of specific chemicals (osmoprotectants) that impart increased resistance to arid or saline conditions. The ultimate objective is to identify the genes controlling the synthesis of these compounds with a view to their transfer to appropriate agriculturally significant species.

RÜDIGER BIELER

Assistant Curator and Head, Invertebrates; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

M.Sc., Biology, Geography and Biology-Education, University of Hamburg, 1982.
Ph.D., Zoology, University of Hamburg, 1985.

Research Associate of Malacology, Museum of Comparative Zoology, Harvard University.
Managing Editor, Numouria.
Editorial Board Member: Malacologia, The Nautilus.
Secretary, Council of Systematic Malacologists.
Editor-in-Chief, Monographs of the Marine Mollusca.
Trustee, Board of Directors, Delaware Museum of Natural History.

Evolutionary biology of mollusks, especially Gastropods.

Research concentrates on the evolution, comparative anatomy, zoogeography and reproductive biology of gastropods (snails). Emphasis is placed on the currently unresolved "higher-level" phylogenetic relationships between various gastropod orders and subclasses. How are the marine shell-bearing snails, the sea slugs and the land snails interrelated? Where do they come from? Does the fossil record corroborate our hypotheses? Data are collected by employing a combination of field and laboratory techniques (ranging from collecting by SCUBA diving to serial-section histology and electron microscopy), and are derived in part from Field Museum's extensive holdings of Recent and fossil mollusks. More narrowly defined subprojects deal wit a group of marine snail families called "Heterostropha." These are not only of interest due to their unusual anatomical features and still uncertain relationships to other snail groups, but their long-range larval distribution and excellent fossil record also allows to address general biological questions such as: How does a high-dispersal marine vertebrate animal speciate? Also continuing is monographic work on worm-snails (an enigmatic group that includes important reef builders in the world's oceans), forming the basis for future phylogenetic and zoogeographic studies.

* * *

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JOHN R. BOLT

Curator, Fossil Reptiles and Amphibians; Lecturer, Committee on Evolutionary Biology, University of Chicago; Associate Professor, University of Illinois at Chicago

B.S., Geology, Michigan State University, 1962.
Ph.D., Paleozoology, University of Chicago, 1968.

Chair, Department of Geology, Field Museum of Natural History, 1981-1990.

Early diversification of tetrapods, particularly amphibians, of Mississippian, Pennsylvanian, and Early Permian age (ca. 360 to 270 million years before present)/systematics/comparative and functional morphology/biogeography.

Current studies are focused on: i) Relationships and morphology of primitive amphibians (as well as fish) from a new Mississippian (ca. 335 million years before present) locality in southeastern Iowa. The locality has produced hundreds of specimens of the oldest tetrapods known from continental North America. Complete specimen preparation will require several years. ii) Fossil evidence for the origin and early evolution of the tetrapod auditory system, and its implications for otic evolution as well as tetrapod relationships. iii) Origin and early evolution of the living amphibians (lissamphibians). I am interested in supervising student research on systematics, morphology, and biogeography of Paleozoic reptiles and amphibians.

* * *

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WILLIAM BURGER

Curator, Vascular Plants; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., Columbia University, 1953.
M.Sc., Cornell University, 1958.
Ph.D., Washington University, 1961.

Chair, Department of Botany, Field Museum of Natural History, 1978-1985.

Flora of Costa Rica/speciation and species richness in Costa Rican flowering plants/early evolution of angiosperms and processes of angiosperm diversification.

The Flora Costaricensis is an encyclopedia-like review of the native and naturalized plants of Costa Rica, with keys, illustrations, descriptions and short discussions. It is published in parts, each covering a single large family or several smaller families. The work attempts to define and characterize the species and facilitate user identification.

The flowering plants of Costa Rica probably number close to 10,000 species, packed into an area about the size of West Virginia. Taxonomic review of many unrelated families has disclosed repeated geographic and altitudinal patterns, while making it clear that closely related species rarely grow in the same habitat. Analysis of these patterns may give us insights into the speciational processes that have helped produce so rich a flora.

The early evolution of angiosperms is poorly understood, while the origin of angiosperms is still as much an "abominable mystery" as when Darwin so described it. Current thinking about early angiosperm evolution continues a tradition of more than 50 years and is virtually unanimous. By exploring radically different scenarios it may be possible to develop new insights into early morphological trends, or at least challenge the confidence of current thinking in the field.

* * *

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IGNACIO CASANOVA

Interim Curator of Meteoritics; Research Associate, Department of Geophysical Sciences, University of Chicago

B.S., Geology, University of Barcelona, 1986.
M.S., Geology, University of Barcelona, 1988.
Ph.D., Geology, University of New Mexico, 1990.

Research Prize, CIRIT, Catalonian Government, 1987.
Award, NASA Jet Propulsion Laboratory, 1989 - 1991.
Research Associate, U.S. National Academy of Sciences and NASA, Johnson Space Center (1990-1992).

Meteoritics and Mineralogy.

Meteorites have preserved many of the original signatures of the conditions that reigned 4.6 billion years ago in our solar system and, therefore, are samples of unique scientific importance. The analysis of their metallic minerals provides important insights about the early evolution of the planets and the chemical compositions of their otherwise inaccessible interiors. Meteorite research in the Field Museum is carried out in collaboration with the University of Chicago and addresses a variety of topics, including the characterization of new specimens, the study of primordial inclusions in carbonaceous chondrites, the mineralogy and geochemistry of meteoritic metal, and the isotopic composition of meteoritic and planetary materials. This involves the study of a wide variety of specimens with sophisticated tools like the electron and optical microscopes, mass spectrometers, X-ray microanalyzers, high-temperature furnaces and image processing systems. My current research includes the characterization of unique silicate inclusions in the Colomera and Watson iron meteorites, the study of the stability of rare minerals like perryite (nickel silicide) and osbornite (titanium nitride), the mineralogy and crystal chemistry of silicon-bearing meteoritic metal, and the geochemistry of ultra refractory inclusions in carbonaceous chondrites.

The Field Museum holds one of the world's largest, best documented and accessible meteorite collections. The research and sample preparation facilities of the Department of Geology offer an excellent setting for the systematic study of meteorites and minerals. Our close cooperation with the Adler Planetarium and the University of Chicago provides a unique environment for Meteoritics and Planetary Science research and education.

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1986. (with E.A. King, A. San Miguel, K. Keil) Inventory of the meteorite collection of the Museo Nacional de Ciencias Naturales, C.S.I.C., Madrid, Spain. Meteoritics 21:193-197.

1987. (with A. San Miguel) Heterogeneity and metamorphic processes in ordinary chondrites: evidences from a study of Spanish meteorites. In: II Congreso Geoquimica Espana, pp. 337-339.

1990. (with K. Keil, R. Wieler, A. San Miguel and E. A. King) Origin and history of chondrite regolith, fragmental and impact-melt breccias from Spain. Meteoritics 25:127-135.

1991. Geochemistry and origin of metal in aubrites. Lunar and Planetary Science XXII:185-186.

1992. (with L.J. Perdiguero) Relationships between chondritic and iron meteorites. In: IV Congreso Geoquimica de Espana pp. 865-872.

BARRY CHERNOFF

Associate Curator and Head, Division of Fishes; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor of Neotropical Zoology, Universidad Central de Venezuela

B.A., State University of New York at Stony Brook, 1973.
M.A., Adelphi University, 1976.
Ph.D., University of Michigan, 1983.

Board of Governors, American Society of Ichthyology and Herpetology, 1985-1989.
Professor of Neotropical Zoology, Universidad Central de Venezuela, 1988.
Research Associate, Academy of Natural Sciences of Philadelphia.
Book Review Editor, Systematic Zoology, 1987-1989.
Editorial Board, Fishes of Western North Atlantic.

Systematic biology of South American freshwater fishes and silverside fishes of the world/morphometrics/morphological evolution/systematics/biogeography.

One research aspect includes phylogenetic studies and revisions of silverside fishes (Atherinidae) and tetras from South America (Characidae and Anostomidae). Along these lines, I am pursuing research on phylogenetic relationships of the Atherinomorpha. The Atherinomorpha have been one of the most hotly debated superorders of fishes; the results of this study will radically alter our view of acanthopterygian fishes. My work on South American characiform fishes involves both higher-level phylogenetic studies as well as studies at the species and population level. Much of the data from silverside and tetra research fits into the second phase of Chernoff's studies on the theory and methodology of morphological evolution. These latter studies investigate the phylogenetic implications of modifications to developmental programs as well as to patterns of ontogenetic covariance.

I would be pleased to supervise students interested in applying developmental, morphological or biochemical data to the resolution of interesting questions in fish evolution or pursuing projects on systematic relationships of fishes. The Field Museum has excellent collections of recent fishes, with strong emphases on neotropical freshwater fishes as well as biochemical and morphometrics/image analysis laboratories for use in systematic and evolutionary studies.

* * *

1982. Character variation among populations and the analysis of biogeography. American Zoolologist 22(2): 425-439.

1984. (with C. D. Barbour) Comparative morphology and morphometrics of the pescados blancos (Genus Chirostoma) from Lake Chapala, Mexico. In: Evolution of Fish Species Flocks, A. A. Echelle and I. Kornfield (eds.), pp. 111-127. Oklahoma State University Press, Stillwater, OK.

1985. (with F. L. Bookstein, R. L. Elder, J. M. Humphries, G. R. Smith and R. E. Strauss) Morphometrics in Evolutionary Biology. The Geometry of Size and Shape Change, with Examples from Fishes. Academy of Natural Sciences Special Publication No. 15, 277 pp.

1987. Systematics of American atherinid fishes of the genus Atherinella. I. The subgenus Atherinella. Proceedings of the Academy of Natural Sciences, 138: 86-188.

1987. Phylogenetic relationships and reclassification of menidiine silverside fishes, with emphasis on the tribe Membradini. Proceedings of the Academy of Natural Sciences, 138: 189-249.

1990. Evolutionary and phylogenetic inferences from morphometric data. Biological Journal of the Linnean Society.

PETER R. CRANE

Vice President, Center for Evolutionary and Environmental Biology and MacArthur Curator, Fossil Plants; Professor, Department of the Geophysical Sciences, University of Chicago; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor, University of Massachusetts

B.Sc., Botany, University of Reading, 1975.
Ph.D., Paleobotany, University of Reading, 1981.

Post-doctoral Research Scholar, Indiana University.
Bicentenary Medal of the Linnean Society of London, 1984.
Visiting Professor, Botanischer Garten und Institut für Systematische Botanik der Universität Zürich, 1987.
Visiting Professor, Botany Department, University of Massachusetts, 1989.
Vice-Chairman, Association of North American Paleontological Societies.
Editorial Board, International Journal of Plant Science.
Editorial Board, Review of Paleobotany and Palynology.
Editor, Paleobiology, 1984-1986.
Visiting Research Fellow, The Natural History Museum, London, U.K.
Senior Mellon Fellow, Smithsonian Institution.

Paleobotany of land plants, particularly the origin and early evolution of angiosperms.

Recent work has been concerned mainly with early land plants and angiosperms. Studies on angiosperms have addressed four questions: To which living or fossil seed plants are angiosperms most closely related? What are the closest living relatives of early fossil angiosperms? What was the timing and pattern of the early angiosperm diversification? What vegetational and other biotic changes occurred in association with the angiosperm diversification between about 130 and 65 myr B.P.? Current field work in eastern North America, central Portugal and Ecuador has recovered well-preserved microscopic flowers of early angiosperms and related plants from the mid-Cretaceous (about 100 myr B.P.). Scanning electron microscopy of this material is providing important morphological and systematic data, as well as insights into pollination and other aspects of reproductive biology in early angiosperms. Studies of pollen grains preserved in situ within flowers also provide a more secure basis for ecological interpretations of the fossil palynological record. Ultimately, these studies and associated syntheses of Cretaceous palynological data currently underway at the Field Museum are designed to improve our understanding of the large-scale biotic and environmental changes that occurred during the critical mid-Cretaceous phase of Earth history.

I will be pleased to supervise students interested in the higher-level systematics and phylogeny of extant or fossil plants, or who wish to apply paleobotanical data to interesting questions in plant evolution or vegetational history. The Field Museum has excellent collections of extant and fossil plants, as well as appropriate biochemical and morphometrics/image analysis laboratories.

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1985. Phylogenetic analysis of seed plants and the origin of angiosperms. Annals of the Missouri Botanical Garden, 72: 716-793.

1987. (with E. M. Friis and W. G. Chaloner) (eds.) The Origins of Angiosperms and their Biological Consequences. Cambridge: Cambridge University Press, x + 337 pp.

1989. (with S. Blackmore) (eds.) Evolution, Systematics and Fossil History of the Hamamelidae. Volumes 1 & 2. Oxford: Oxford University Press.

1989. Patterns of evolution and extinction in vascular plants. In: Evolution and the Fossil Record, K.C. Allen and D.E.G. Briggs (eds.), pp. 154-187. Belhaven Press.

1989. (with S.H. Lidgard) Paleolatitudinal gradients and temporal trends in Cretaceous floristic diversity. Science, 246: 675-678.

MICHAEL O. DILLON

Curator, Vascular Plants; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., University of Northern Iowa, 1969.
M.A., University of Northern Iowa, 1972.
Ph.D., University of Texas at Austin, 1976.

Visiting Professor & Curator, Beal-Darlington Herbarium, Michigan State University.
Arnold Arboretum Associate, Harvard University.
Research Associate, Missouri Botanical Garden.
Research Associate, Museo de Historia Natural "Javier Prado", Lima, Peru.

Systematics of Neotropical Asteraceae; Coastal South American Ecology and Biogeography; Amphitropic Disjunctions; Floristic Inventories, databases, and networking.

Research projects involve exploration, description, biosystematic study, and conservation of biodiversity within the Neotropics of western South America. One project studies unique plant communities (lomas formations) that exist within the hyper-arid deserts of coastal Chile and Peru; habitats that are directly influenced by the El Nino weather patterns. A decade of field studies are summarized in a specimen-oriented computerized database that will soon include color images and distribution maps. Ecological adaptations and evolutionary relationships of selected genera are under investigation. Combination of these data will identify biogeographic patterns and test hypotheses on the age and origin of the deserts.

My Peruvian colleagues and I are continuing a floristic inventory of highly threatened fragments of montane forests in northern Peru that were once more continuous. We have completed a detailed inventory from of one site (Bosque Monteseco) and our studies have lead to new distribution records and the description of several plant and animal species new to science. These these inventories will aid in conservation of the remaining habitats and will contribute to the training of young Peruvian scientists.

Studies in the Asteraceae (sunflower family) are progressing along several lines. A generic synopsis of tribe Inuleae for all of South America has recently been published, which included a detailed micro-morphological survey of 24 genera and over 200 species. The evolution of the Inuleae within the Andean Cordillera is being studied to determine how plants adapt to these demanding alpine environments. Lastly, Dr. Nancy Hensold and I recently contributed the sunflower family to The Catalogue of the Flowering Plants and Gymnosperms of Peru, which included a computerized biblographic and biological database of over 1400 species of Asteraceae.

* * *

1986. (with A. Sagástegui) Jalcophila, a new genus of Andean Inuleae (Asteraceae). Brittonia 38:162-167.

1990. (with P.W. Rundel) The botanical response of the Atacama and Peruvian Desert Flora to the 1982-83 El Nino event. In: Global Ecological Consequences of the 1982-83 El Nino-Southern Oscillation, P.W. Glynn (ed.), pp. 487-504. Elsevier, New York.

1991. (with P.W. Rundel, B. Palma, H.A. Mooney, S.L. Gulmon, & J.R. Ehleringer) The phytogeography and ecology of the coastal Atacama and Peruvian Deserts. Aliso 13(1):1-50.

1991. (with A. Sagástegui) Family Asteraceae: Part V. Tribe Inuleae. In: Flora of Peru, J. Francis Macbride & Collaborators, Fieldiana: Botany, new series 26:1-70.

1991. A New Species of Tillandsia (Bromeliaceae) from the Atacama Desert of Northern Chile. Brittonia 44:11-16.

1991. (with A. Sagástegui) Inventario Preliminar de la Flora del Bosque Monteseco (Cajamarca, Peru). Arnaldoa (1):35-52.

1992. (with A. Sagástegui) Sinopsis de los Géneros de Gnaphaliinae (Asteraceae-Inuleae) de Sudamerica. Arnaldoa 1(2): 5-91.

JOHN J. ENGEL

Curator, Bryophytes and Chair, Department of Botany

B.S., University of Wisconsin-Milwaukee, 1965.
M.S., University of Wisconsin-Milwaukee, 1967.
Ph.D., Michigan State University, 1972.

Council Member, International Association of Bryologists.

Hepatic systematics and phytogeography of south temperate and subantarctic regions.

The primary objective of my research program is to come to an understanding of hepatic systematics and phytogeography of south temperate and subantarctic regions. These geographic areas present an ideal natural laboratory to investigate biological questions relevant to evolutionary persistence, dispersibility and survival and evolution of plants faced with environmental change. Within that framework I am engaged in both detailed, in-depth studies (monographic studies) of various groups, as well as less detailed, more documentary studies (floristic survey work). My program includes elements of biogeography, ecology, morphology and phylogeny. I am also investigating problems involving functional morphology of hepatic structures and in a broad evolutionary context.

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1980. A monograph of Clasmatocolea (Hepaticae). Fieldiana: Botany, new series 3:i-viii, 1-229.

1985. (with R. M. Schuster) Austral Hepaticae V (2). Temperate and subantarctic Schistochilaceae of Australasia. Journal of the Hattori Botanical Laboratory 58: 255-539.

1990. Falkland Island (Islas Malvinas) Hepaticae and Anthocerotae: A taxonomic and phytogeographic study. Fieldiana: Botany, new series 25:1-209.

1991. Studies on Geocalycaceae (Hepaticae). IV. Lamellocolea, a new genus of Leptoscyphoideae from New Zealand. Journal of the Hattori Botanical Laboratory 70: 63-78.

1992. Studies on Geocalycaceae (Hepaticae). VIII. A revision of Chiloscyphus subg. Notholophocolea (Schust.) Engel & Schust. Journal Hattori Botanical Laboratory 72: 105-115.

JOHN J. FLYNN

Curator, Fossil Mammals and Chair, Department of Geology; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

B.A., Geology and Geophysics, Yale University, 1977.
M.A, Geological Sciences, Columbia University, 1979.
Ph.D., Geological Sciences, Columbia University, 1983.

Alfred Sherwood Romer Prize (4th Annual), Society of Vertebrate Paleontology, 1982.
Associate Editor, Journal of Vertebrate Paleontology, 1988-present.
Leader of numerous field expeditions supported by the NSF, NASA, National Geographic Society, etc.
Research Associate, American Museum of Natural History.

Mammalian systematics and evolution/geochronology and plate tectonics/biogeography.

Research emphasizes a multidisciplinary approach to geologic and biologic problem solving, incorporating my interests in two different, but related geologic specialties: mammalian paleontology and paleomagnetism. Recent field expeditions and laboratory projects integrating biostratigraphy, paleomagnetic stratigraphy, and radioisotopic dating have included: i) refinement of the Cenozoic geologic time scale; ii) constraining the faunal evolution and plate tectonic movements of the Baja Peninsula, Mexico, during the last 80 million years; iii) new discoveries of fossil mammal faunas in South America, providing a better understanding of South American mammal faunal evolution and biogeography; and iv) constraining the tectonic and uplift history of the Andean Mountain belts. Recent field studies have ranged throughout the U.S., Mexico, and South America. I have established a Paleomagnetism Laboratory at the Field Museum that is available for student research. Another aspect of my research has focused on investigation of the anatomy and evolutionary relationships of the mammalian order Carnivora, and its extinct relatives. One project in this area is using the Image Analysis systems to investigate morphometric variation in carnivores, and to elucidate phylogenetic and functional influences on cranial shape.

I am interested in students with research interests in: i) integration of paleontologic and geologic techniques, particularly those emphasizing patterns of paleobiologic change through geologic time; or ii) any aspect of mammalian phylogeny or patterns of mammalian faunal change through time and space. Field Museum has excellent Recent and fossil mammal collections, a biochemical laboratory (for DNA sequencing), and morphometrics/image analysis laboratories for use by students.

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1984. (with B.J. MacFadden and M.C. McKenna) Land-Mammal Ages, faunal heterochrony, and temporal resolution in Cenozoic terrestrial sequences. Journal of Geology 92: 687-705.

1985. (with W.A. Berggren, D.V. Kent and J.A. Van Couvering) Cenozoic geochronology. Geological Society of the America Bulletin 96:1407-1418.

1986. Faunal Provinces and the Simpson Coefficient. In: Vertebrates, Phylogeny, and Philosophy, K. Flanagan and J.L. Lillegraven (eds.), pp. 317-338. University of Wyoming, Contributions to Geology, Special Paper 3.

1986. Correlation and geochronology of middle Eocene strata from the western United States. Palaeogeog., Palaeoecol., Palaeoclim. 55: 335-406.

1988. (with N.A. Neff and R.H. Tedford) Phylogeny of the Carnivora. In: The Phylogeny and Classification of the Tetrapods, Volume 2: Mammals, M. J. Benton (eds.), pp. 73-116. The Systematics Association Special Volume No. 35B, Oxford: Clarendon Press.

1989. (with R.M. Cipolletti and M.J. Novacek) Paleontology and Geochronology of Early Eocene Marine and Continental Strata, Baja California, Mexico. Geological Society of the America Bulletin 101:1182-1196.

LANCE GRANDE

Curator, Fossil Fishes; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago; Adjunct Professor of Biology, University of Massachusetts; Visiting Professor, University of Illinois-Chicago

B.S., Geology, University of Minnesota, 1976.
M.S., Geology and Zoology, University of Minnesota, 1979.
Ph.D., Evolutionary Biology, City University of New York/American Museum of Natural History, 1983.

Research Associate, American Museum of Natural History.
Editorial Board, Revista.
Associate Editor, Journal of Vertebrate Paleontology, 1986-1988.

Phylogenetic interrelationships/historical biogeography of fossil and living actinopterygian fishes. The relationship between the evolution of organisms, and the evolution of the surface of the Earth.

In the most general sense, my research program uses studies of comparative osteology and ontogeny in fossil and living fishes to investigate questions about evolution and historical biogeography. My approach is an interdisciplinary one. I am interested in both fossil and living fishes, so I selected taxonomic groups for study that have extant species together with well preserved fossil species. Groups of particular interest to me are Siluriformes (catfishes), Acipenseriformes (sturgeons and paddlefishes), Clupeomorpha (herring and herring-like fishes), Osteoglossomorpha (bony-tongues) and several other lower teleostean groups.

I am also pursuing studies on ontogeny in the fossil record and late ontogeny in extant species. The different types of intraspecific morphological variation (i.e. ontogenetic vs. non-ontogenetic) and its effect on phylogenetic reconstruction is also part of my recent research program, as is the use of paleontology in systematics and historical biogeography.

I would be particularly pleased to supervise students interested in doing phylogenetic work on some groups of fossil and living fishes. In particular, I would like to support thesis projects involving detailed osteological analyses that include studies of ontogeny, historical biogeography and/or related topics of general significance. Field Museum has the best fossil fish collection in North America (in terms of size and diversity) and includes an abundance of exceptionally well preserved fossil material. The Museum also has an excellent collection of Recent fishes.

* * *

1985. The use of paleontology in systematics and biogeography, and a time control refinement for historical biogeography. Paleobiology 11(2):1-11.

1985. (with G. Nelson). Interrelationships of fossil and Recent anchovies (Teleostei: Engrauloidea) and a description of a new species from the Miocene of Cyprus. American Museum Novitates 2826:1-16.

1986. (with J.T. Eastman). A review of the Antarctic ichthyofaunas, in light of new fossil discoveries. Palaeontology 29(1):113-137.

1987. Redescription of the Eocene catfish Hypsidoris with a reassessment of its phylogenetic relationships. Journal of Vertebrate Paleontology 7(1):24-54.

1991. (with W. Bemis). Osteology and phylogenetic relationships of fossil and Recent paddlefishes (Polyodontidae) with comments on the interrelationships of Acipenseriformes. Society of Vertebrate Paleontology Memoir 1 (supplement to Vol. II, no. 1 , Journal of Vertebrate Paleontology, pp i - 121).

1992. (with W. Bemis) Early development of the actinopterygian head. General observations and comments on staging of the paddlefish Polyodon spathula. Journal of Morphology 213: 47-83.

LAWRENCE R. HEANEY

Associate Curator and Head, Division of Mammals; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.S., Biology, University of Minnesota, 1971.
M.A., Systematics and Ecology, University of Kansas, 1975.
Ph.D., Systematics and Ecology, University of Kansas, 1979.

Research Fellow, Smithsonian Institution, 1986-1988.
Fellow, Linnean Society of London.
Research Associate, Smithsonian Institution.
Honorary Curator, Department of Zoology, Philippine National Museum, 1990-present.
Science Advisor, Center for Tropical Conservation Studies, Silliman University, Philippines.

Mammalian evolution and ecology/evolutionary biogeography/origin and maintenance of patterns of biological diversity/conservation biology/tropical biology.

In spite of the long-term interest of biologists in the dynamics of the processes that influence patterns of biological diversity, a comprehensive understanding has yet to emerge. My current research program focuses on the ecology and evolution of mammals on the islands of Southeast Asia, especially the Philippines, as a natural laboratory where the influence of area, habitat diversity, degree of isolation, and geological histories may be investigated. Variation in these factors allows direct investigation of patterns of extinction, colonization, and speciation in a remarkably diverse fauna. Studies include analysis of morphological, genetic, and ecological diversification, evolution of life history traits, reproductive ecology, and plant-animal interactions. Rapid destruction of natural habitats and extinction of native species has led me to integrate formal ecological and evolutionary studies with research on the impact of deforestation and to extensive training and consulting activities.

Students would be welcome to undertake studies in any of these areas, whether as part of the SE Asian project or independently. Past students have studied reproductive ecology of bats, seed dispersal systems, tree squirrel population biology, mammalian paleoecology, evolution and functional morphology of horned mammals, and population biology of tropical birds.

* * *

1978. Island area and body size of insular mammals: evidence from the tri-colored squirrel (Callosciurus prevostii) of Southeast Asia. Evolution 32: 29-44.

1984. Mammalian species richness on islands on the Sunda Shelf, Southeast Asia. Oecologia 61:11-17.

1984. Climatic influences on life history tactics and behavior of North American tree squirrels. pp. 43-78. In: The Biology of Ground Dwelling Squirrels, J.O. Murie and J.R. Michener (eds.). Univ. Nebraska Press. 459 pp.

1985. (with R. M. Timm). Morphology, genetics, and ecology of pocket gophers (genus Geomys) in a narrow hybrid zone. Biological Journal of the Linnean Society 25: 301-317.

1986. L.R. Heaney and B. D. Patterson, eds. Island Biogeography of Mammals. Academic Press, London. 271 pp. (initially produced as a special issue of the Biological Journal of the Linnean Society, London).

1989. (with P. D. Heideman, E. A. Rickart, R. B. Utzurrum, and J. S. H. Klompen) Elevational zonation of mammals in the central Philippines. Journal of Tropical Ecology 5: 259-280.

ROBERT F. INGER

MacArthur Curator, Amphibians & Reptiles; Lecturer, Committee on Evolutionary Biology, University of Chicago

Ph.D., University of Chicago, 1954.

Distinguished Scientist, Field Museum of Natural History.
Honorary Curator of Reptiles, Sarawak Museum.

Community ecology/tropical amphibians and reptiles/systematics of anuran amphibians.

Although much has been written about the organization or structure of tropical communities of vertebrates, almost nothing is known about variation of those communities within a region or over time. I am studying variation in the structure of communities of amphibians in Bornean forests over time (one to twenty years) and space. This program involves work both in the field and in the museum laboratory and analysis of species diversity at the local and regional levels, relative abundances of species, movements of individuals, annual patterns of reproduction, and partitioning of spatial resources by adults and larvae.

My systematics research concentrates on phylogenetic relations of several families of anurans that form important components of the fauna of Southeast Asia and adjacent islands. One concern of these investigations is the extent of parallel morphological diversification of adults and larvae. Another concern is the relation between morphogenetic constraints and ecological distribution in larvae.

I am interested in advising students working on community ecology in tropical forests or developmental morphology of anuran larvae.

* * *

1986. (with H. K. Voris & K. J. Frogner) Organization of a community of tadpoles in rain forest streams in Borneo. Journal of Tropical Ecology 2: 193-205.

1989. (with E. Nodzenski & R. J. Wassersug) Developmental differences in visceral morphology in megophrynine pelobatid tadpoles in relation to their body form and mode of life. Biological Journal of the Linnean Society 38: 369-388.

1991. Uncoupling of related structural changes in metamorphosing torrent-dwelling tadpoles. Copeia 1990: 1047-1054.

1992. Variation in apomorphic characters in the stream-dwelling tadpoles of the bufonid genus Ansonia. Zoological Journal of the Linnean Society 105: 225-237.

1993. (with R. B. Stuebing) The montane amphibian fauna of northwestern Borneo. Malayan Nature Journal 46: 41-51.

JOHN KETHLEY

Associate Curator, Insects; Lecturer, Committee on Evolutionary Biology, University of Chicago; Lecturer, Department of Entomology, Ohio State University.

B.S., University of Georgia, 1964.
Ph.D., University of Georgia, 1969.

NIH Post-doctoral Trainee, The Acarology Laboratory, Ohio State University.

Systematics and phylogeny/comparative developmental morphology/zoogeography and cytology of acariform mites.

This research program centers on the phylogeny of supra-generic taxa of prostigmatid and early derivative acariform mites. A major component is assembly and analysis of data sets describing comparative developmental character state changes. Secondary, but parallel studies involve the systematics and ecology of deep soil mites, documentation of patterns of thelytoky and haplo-diploidy, and zoogeographic patterns in prostigmatid mites.

I am interested in supervising student studies of the cytogenetics of early derivative acariform mites exhibiting modified sex ratios.

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1982. Acariformes: Prostigmata In: Synopsis and Classification of Living Organisms Vol. 2, S.P. Parker (ed.), pp. 117-145. McGraw-Hill.

1989. Proteonematalycidae (Acariformes), a new mite family from fore-dune sand of Lake Michigan. International Journal of Acarology 15: 209-217.

1989. R.A. Norton, P.M. Bonamo and W.A. Shear. A terrestrial alicorhagiid mite (Acari: Acariformes) from the Devonian of New York. Micropaleontology 35(4): 367-373.

1990. Acarina: Prostigmata (Actinedida). In: Soil Biology Guide, D. Dindel (ed.), pp. 667-756. John Wiley & Sons, New York.

1990. The prelarva of Alycus roseus Koch (Bimichaeliidae: Acariformes: Acari). Canadian Journal of Zoology 68: 1058-1061.

THOMAS G. LAMMERS

Assistant Curator, Vascular Plants

B.S., Botany, Iowa State University, 1977.
M.A., Biology, University of Northern Iowa, 1981.
Ph.D., Botany, The Ohio State University, 1988.

Education Committee, Botanical Society of America.
Numerous field research expeditions funded by Sigma XI, NSF, William Sherman Turrell Herbarium Fund, National Geographic Society.
Visiting Assistant Professor, Miami University, 1988-1990.

Classification and evolution of the Campanulaceae, especially subfamily Lobelioideae.

My research interests are the evolution and classification of flowering plants. Current focus is the family Campanulaceae, in particular subfamily Lobelioideae. Specific goals are to understand the patterns of evolutionary diversification in the group; to identify the biological processes responsible for those patterns; and to provide a sound and useful classification of the group on this basis. In meeting these goals, I embrace the concept that the best results are obtained through the rigorous and objective synthesis of diverse kinds of data. Work at present involves several poorly understood clades in the Hawaiian Islands, Chile, and the Caribbean, and patterns of chromosomal evolution in the group as a whole.

* * *

1986. (with C.E. Freeman) Ornithophily among the Hawaiian Lobelioideae (Campanulaceae): evidence from floral nectar sugar compositions. American Journal of Botany 73: 1613-1619.

1988. Chromosome numbers and their systematic implications in Hawaiian Lobelioideae (Campanulaceae). American Journal of Botany 75: 1130-1134.

1989. Revision of Brighamia (Campanulaceae: Lobelioideae), a caudiciform succulent endemic to the Hawaiian Islands. Systematic Botany 14: 133-138.

1990. (with D.J. Crawford, T.F. Stuessy, M. Silva, and P. Pacheco) Allozyme variation and evolutionary relationships among three species of Wahlenbergia (Campanulaceae) in the Juan Fernandez islands. Botanical Gazette 151: 119-124.

1990. Sequential paedomorphosis among the endemic Hawaiian Lobelioideae (Campanulaceae). Taxon 39: 206-211.

1991. Systematics of Clermontia (Campanulaceae: Lobelioideae). Systematic Botany Monographs 32: 1-94.

1992. (with N. Henshold) Chromosome numbers of Campanulaceae. II. The Lobelia tupa complex of Chile. American Journal of Botany 79: 585-588.

1992. Circumscription and phylogeny of the Campanulales. Annals of the Missouri Botanical Garden 79: 388-413.

SCOTT LANYON

Curator and Chair, Department of Zoology; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., Biology, S.U.N.Y. College at Geneseo.
M.A., Ecology, Indiana University.
Ph.D., Evolutionary Biology, Louisiana State University.

Fellow, American Ornithological Society.
Expedition Leader for trips to Panama, Peru, Brazil, Bolivia, Marshall Islands, Puerto Rico, & Jamaica.

Avian evolutionary biology/biochemical systematics/systematic philosophy and methodology/evolution of avian social systems.

Research on the ecology and behavior of new world blackbirds (Icterinae) has contributed significantly to our understanding of avian evolutionary ecology. This subfamily contains almost the entire range of behaviors found in songbirds and includes the red-winged blackbird (Agelaius phoeniceus), which may be the most thoroughly studied of all passerine birds. However, because phylogenetic relationships within this assemblage of 97 species are unknown, it is extremely difficult to infer evolutionary processes from the results of these studies. Using characters derived from a variety of sources (starch gel electrophoresis, gene amplification and DNA sequencing, skull osteology etc.), I am reconstructing the phylogeny for this assemblage. To date, this phylogeny has been used to study the evolution of brood parasitism and sexual dimorphism.

I am primarily interested in supervising students who wish to investigate questions in evolutionary biology that have a phylogenetic component and/or use birds as the study organism. Students should have some research experience and a desire to include a strong field work component in their research.

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1985. Detecting internal inconsistencies in distance data. Systematic Zoology 34: 397-403.

1986. (with C.F. Thompson) Site-fidelity and habitat quality as determinants of territory choice in Painted Buntings. Condor 88: 206-210.

1987. Jackknifing and Bootstrapping: Important "new" statistical techniques for ornithologists. Auk 104: 144-146.

1987. (with R.M. Zink) Genetic variation in piciform birds: Monophyly and generic and familial relationships. Auk 104: 724-732.

1988. The stochastic mode of molecular evolution: What consequences for systematic investigations? Auk 105: 565-573.

1989. (with W.E. Lanyon) The systematic position of the plantcutters, Phytotoma. Auk 106: 422-432.

1992. Interspecific brood parasitism in blackbirds (Icterinae): A phylogenetic perspective. Science 225: 77-79.

1992. Of birds and their molecules: A review of Sidley and Ahlquist. Condor 94: 304-310.

SCOTT LIDGARD

Associate Curator, Invertebrate Paleontology; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.S., University of California at Santa Cruz, Earth & Planetary Sciences, 1976.
M.S., Paleobiology, University of Rochester, Geological Sciences, 1979.
Ph.D., Paleobiology, The Johns Hopkins University, Earth & Planetary Sciences, 1984.

Predoctoral Fellow, Paleobiology, Smithsonian Institution, 1982.
NATO Postdoctoral Fellow, British Museum of Natural History, 1984.

Evolution and ecology of cheilostome bryozoans, particularly the relationships of colonial growth and form/evolutionary paleoecology and the resolution of large-scale patterns in the fossil record/angiosperm diversification and Cretaceous floristic trends.

Research focuses on the roles of different modes of growth in large scale patterns of cheilostome bryozoan evolution, environmental distribution, and ecology. My previous work on comparative skeletal ontogenies of zooids within colonies recognized characteristic zooid budding patterns of encrusting cheilostomes. More recently I have synthesized the overriding evolutionary trends in predominant modes of growth in this group, documenting a persistent evolutionary transition in which one mode of growth is supplanted by another during the past 100 million years. In an environmental context, this work has also provided a novel test of paleoenvironmental studies of other groups of marine benthos in which onshore origin was followed by expansion into offshore, deeper water marine environments.

A related research problem involves re-evaluating the dominance through time of the three major groups of cheilostome bryozoans-anascans, cribrimorphs and ascophorans. Increasing calcification of zooids during the successive evolutionary rises of these groups has previously been linked to increasing predation pressure. However, comparisons with bryozoan colony forms and familial diversity patterns suggest that past adaptive interpretations under-appreciated the diversification of taxa with moundlike or erect growth habits, many of which are characterized by ascophoran frontal walls.

Collaborative research (with P. R. Crane) examines large-scale floristic patterns during the radiation of angiosperms. We have employed trend surface analyses to demonstrate a striking latitudinal shift (from tropical to boreal) in the pattern of increasing angiosperm dominance through the Cretaceous. This work is part of more comprehensive synthesis of paleolatitudinal and temporal trends in the apparent diversity of all Cretaceous land plants. Recently, we have also attempted to clarify the rate and magnitude of angiosperm radiation using the parallel fossil records of leaves and pollen/spores, to provide a deductive test of evolutionary tempo during the diversification of a major group of organisms.

* * *

1986. Ontogeny in animal colonies: a persistent trend in the bryozoan fossil record. Science 232: 230-232.

1988. (with P.R. Crane) Quantitative analyses of the early angiosperm radiation. Nature 331: 344-346.

1989. (with P.R. Crane) Angiosperm diversification and paleolatitudinal gradients in Cretaceous floristic diversity. Science 246: 675-678.

1989. (with J.B.C. Jackson) Growth in encrusting cheilostome bryozoans: I. Evolutionary trends. Paleobiology 15: 255-282.

1990. (with P.R. Crane) Angiosperm diversification and Cretaceous floristic trends: a comparison of palynofloras and leaf macrofloras. Paleobiology 16: 77-93.

1990. Growth in encrusting cheilostome bryozoans: II. Circum-Atlantic distribution patterns. Paleobiology 16: 304-321.

GREGORY M. MUELLER

Visiting Associate Curator, Mycology

B.A., Southern Illinois University, 1976.
M.S., Southern Illinois University, Botany, 1979.
Ph.D., The University of Tennessee, Botany, 1982

Chair, Editorial Committee, McIlvainea and The Mycophile.
Alexopoulos Prize, The Mycological Society of America, 1992.
Scientific Advisor, Illinois Mycological Association.
Visiting Scientist, Institute of Physiological Botany, Uppsala University, Sweden. 1982-1983.
Postdoctoral Fellow, Mountain Lake Biol. Station, Pembroke, VA. 1983.
Postdoctoral Research Associate, Department of Botany, University of Washington, Seattle 1984-1985.

Systematics, speciation, population biology and biogeography of Basidiomycetes.

My research program centers on the systematics, ecology, and evolution of higher fungi, especially Agaricales (mushrooms and related fungi). Current work includes 1) a project investigating generic and species composition, distribution, degree of endemism, and host specificity of Agaricales in Central and South American montane oak forests, and 2) a multifaceted project using the genera *Hydnangium*, *Laccaria*, and *Podohydnangium* to test various theories of speciation, coevolution (with their obligate tree symbionts), and biogeography of fungi that form ectomycorrhizae. Field work for these studies is now centered in Costa Rica. Ongoing laboratory studies are focusing on developing robust phylogenies for these fungi and investigating the concordance between morphological, mating, and molecular data in higher fungi. These interrelated projects are providing information on fungal ecology and biology that are crucial to temperate and tropical forest management and conservation.

* * *

1984. (with N. Fries) Incompatibility systems, cultural features and species circumscriptions in the ectomycorrhizal genu Laccaria (Agaricales). Mycologia 76: 633-642.

1985. Numerical taxonomic analyses on Laccaria (Agaricales). Mycologia 77: 121-129.

1988. Laccaria gomezii, a new agaric species form the querceta of Colombia and Costa Rica. Mycotaxon 33: 223-227.

1990. (with M. Gardes, J.A. Fortin and B.R. Kropp) Restriction fragment length polymorphisms in the nuclear ribosomal DNA of four Laccaria spp.: L. bicolor, L. laccata, L. proxima, and L. amethystina. Phytopathology 80: 1312-1317.

1991. Laccaria laccata complex in North America and Sweden: Intercollection pairing and morphometric analyses. Mycologia 83: 578-594.

1992. Systematics of Laccaria (Agaricales) in the continental United States and Canada, with discussions on extralimital taxa and descriptions of extant types. Fieldiana: Botany, new series 30: 1-158.

ALFRED F. NEWTON, JR.

Associate Curator, Insects

A.B., Chemistry, Rutgers University, 1966
A.M., Chemistry, Harvard University, 1970
Ph.D., Zoology, Harvard University, 1973

Research Associate, American Museum of Natural History.
Editorial Board, Psyche, 1978-1986.
Australian Biological Resources Study.
Field Research program supported by NSF, American Philosophical Society, Ernst Mayr Grant, National Geographic Society.

Phylogeny, comparative morphology and evolution of beetles; historical biogeography; insect association with specialized microhabitats.

My current research revolves around studies on the evolution of the large beetle family Staphylinidae (over 45,000 named species). A long-term study of the higher-level classification and evolution of the group continues by focusing on reconstructing the phylogeny of one of the family's four main lineages. I have nearly completed a monographic study of the 185+ New World species of the genus Platydracus, whose species promise to be of special interest for understanding the origin of current distribution patterns of forest-dwelling insects in Mexico and Central America. Collaboration with M.K. Thayer continues on another long-term project to improve knowledge of the staphylinoid beetle fauna of Australia and other southern temperate areas, with the ultimate aim of using this group to help understand the origin of southern disjunct distribution patterns (Australia+New Zealand+Chile) that are very common within the group.

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1982. (with J.F. Lawrence) Evolution and classification of beetles. Annual Review of Ecology and Systematics, 13: 261-190.

1984. Mycophagy in Staphylinoidea (Coleoptera). In: Fungus/Insect Relationships, Q. Wheeler and M. Blackwell (eds.), pp. 302-353. Perspectives in Ecology and Evolution, Columbia University Press, New York.

1988. (with M.K. Thayer) A critique on Naomi's phylogeny and higher classification of Staphylinidae and allies (Coleoptera). Entomologia Generalis 14: 63-72.

1989. (with D.S. Chandler) World catalog of the genera of Pselaphidae (Coleoptera), Fieldiana: Zoology, new series 53: 1-93.

1990. Larvae of the Staphyliniformia (Coleoptera): where do we stand? Coleopterists Bulletin 44: 205-210.

1990. Staphylinidae (adults) and Staphylinidae (larvae). In: Soil Biology Guide, D.L. Dindal (ed.), pp. 1137-1174. J. Wiley and Sons, New York.

1992. Current classificaiton and family-group names in Staphyliniformia (Coleoptera). Fieldiana: Zoology, new series 67: 1-92.

MATTHEW H. NITECKI

Curator, Fossil Invertebrates; Lecturer, Committee on Evolutionary Biology and Biological Sciences Collegiate Division, University of Chicago

M.S., Geology, University of Chicago.
Ph.D., Paleozoology, University of Chicago.

Visiting Investigator, USSR Academy of Sciences, 1978.
Guest Scientist, USSR Academy of Sciences, 1981.
Exchange Scholar, National Academy of Sciences, 1984.
Research Scholar, Fulbright-Hays, 1985-1986.
Editor, Paleontological Journal.
Visiting Professor, University of Oslo, 1991-1992.

Problematic fossils/history and sociology of science/theoretical evolutionary biology.

Problematic Fossils: Reconstruction of the history of the biosphere is among the main goals of evolutionary biology, and problematic fossil groups play a pivotal role in this, for it is they that require us to reshape our ideas of the history of life. The problematic fossils that Nitecki studies (cyclocrinitids and receptaculitids) do not fit into any living phylum, and thus represent the record of early experiments with life.

History and Sociology of Science: Nitecki has conducted a series of studies designed to provide some evidence on when, why, and by whom scientific theories are accepted. He is seeking to determine the underlying structure of scientific attitudes and beliefs, not only about facts and relationships, but also about the nature of science - its practices, processes, and norms. He has begun to devise a methodology for testing why and when scientific theories are rejected.

Theoretical Evolutionary Biology: There is currently more interest in the application of evolutionary accounts and methodologies in the social sciences and humanities than at any time since the days of Darwin. Furthermore, the current interest is more methodological and less "sociopolitical." To some extent, this rebirth of interest has been stimulated by the publication of series of multiauthored books edited by Nitecki. The issues discussed are not only of broad general interest but also of great significance for understanding the nature of historical inquiry and its relation to the general issue of human evolution.

* * *

1972. North American Silurian Receptaculitids Algae: Fieldiana: Geology, 28:1-108.

1979. (with D.F. Toomey) Organic Buildups in the Lower Ordovician of Texas and Oklahoma. Fieldiana: Geology, new series 2: 1-181.

1982. (with D.C. Fisher) Standardization of the Anatomical Orientation of Receptaculitids. Paleo. Soc. Mem., 13:1-40.

1985. (with A. Hoffman) Reception of the asteroid hypothesis of terminal Cretaceous extinctions. Geology, 13 (2): 884-887.

1986. (with A. Hoffman) (eds.) Problematic Fossil Taxa. Oxford University Press.

1988. Evolutionary Progress. (ed.) University of Chicago Press.

1992. (with D.V. Nitecki) (eds.) History and Evolution. SUNY Press.

BRUCE D. PATTERSON

Curator, Mammals; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor, Department of Biological Sciences; University of Illinois at Chicago; Adjunct Professor, Department of Biological Sciences, Northern Illinois University

B.S. 1974, St. Lawrence University, Biology
M.S. 1978, New Mexico State University, Biology
Ph.D. 1981, New Mexico State University, Biology (Experimental Statistics)

1980 American Society of Mammalogists Award.
1981 James Davis Prize of New Mexico State University.
1983-1993 led various scientific expeditions to Chile, Peru, and western and southeastern Brasil.

Historical and insular biogeography/systematics of Neotropical mammals/distribution and abundance/niche relationships.

Research seeks to understand the spatial and temporal organization of biological diversity, especially the diversification and coexistence of living mammals. This work is based in biogeography, and field studies are often inventories of poorly sampled areas of South America, to sample for subsequent museum-based research. Laboratory approaches include statistical analysis of distribution and abundance, comparative anatomy, morphometrics, and biochemical surveys (allozymes and PCR analyses).

Studies on insular mammals showed that depauperate faunas contained a subset of the species found in richer biotas. Thus, islands arranged by species richness form a nested series. This non-random structure of species composition in insular biotas characterizes a striking variety of taxa, including plants, insects, mollusks, reptiles, birds, and mammals. On-going studies demonstrate that this pattern is also found in non-isolated mainland communities. The implications of such structure for conservation, for ecological resource partitioning, and for coevolutionary responses among species are being addressed.

Patterns and processes of historical biogeography are also under investigation. Neotropical fieldwork has sampled a number of important centers of endemism. Phylogenetic analyses of rodents, marsupials, and bats are being used not only to elucidate their evolutionary relationships, but also to identify concordant patterns of differentiation, and thus historical relationship, among the regions of endemism. Interesting patterns are emerging regarding the relatives ages of different biogeographic regions. Ecological biogeography is another related interest, seeking insight into the structure and resource use of diverse Neotropical communities through the use of Andean elevational gradients in Chile and Peru. Assessing the relationship between natural distribution patterns and biological conservation in parks and reserves is an on-going concern.

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1987. The principle of nested subsets and its implications for biological conservation. Conservation Biology 1:323-334.

1989. (with Meserve, P. L. & Lang, B. K.) Distribution and abundance of small mammals along an elevational transect in temperate rainforests of Chile. Journal of Mammology 70: 67-78.

1990. (with Patton, J. L.) Fluctuating asymmetry and allozymic heterozygosity among natural populations of pocket gophers (Thomomys bottae). Biological Journal Linnean Society 40: 21-36.

1991. The integral role of biogeographic theory in the conservation of tropical forest diversity. In: Latin American mammals: History, Biodiversity, Conservation, M.A. Mares and D.J. Schmidly (eds.), pp. 124-149. University of Oklahoma Press, Norman, OK.

1991. (with V. Pacheco) Phylogenetic relationships of the New World bat genus Sturnira (Chiroptera: Phyllostomidae). Bulletin American Museum of Natural History 206: 101-121.

A. TOWNSEND PETERSON

Assistant Curator, Birds; Adjunct Professor, Facultad de Ciencias, UNAM, Mexico

B.S., Zoology, Miami University, 1985.
M.S., Committee on Evolutionary Biology, University of Chicago, 1987.
Ph.D., Committee on Evolutionary Biology, University of Chicago, 1990.

Postdoctoral Researcher, Division of Mammals, FMNH, 1991-1992.
Research Associate, Museum of Natural Science, Louisiana State University, 1990-1991.
Nelson-Baroody Student Paper Award, American Ornithologists' Union, 1990.
Chapman Award, American Museum of Natural History, 1988.
Leader of numerous research field trips supported by NSF, National Geographic Society and Sigma Xi.
Editorial Board, Pulicaciones Especiales del Museo de Zoología, Facultad de Ciencias, UNAM; and Anales del Instituto de Biologia, UNAM.

Avian systematics; speciation; evolutionary rates of molecular, morphological, and behavioral characters; sexual selection.

My research focuses on genetic variation and differentiation among populations of birds in Middle America. I am also working with colleagues in Mexico (supported by the N.S.F. and U.S. AID) to investigate patterns of distribution, diversity, endemism, and range limitation in the birds of Mexico. A major aim of this research is to provide new data and interpretations that are crucial for a rational approach toward conservation biology in Mexico and other areas.

I am very interested in working with students interested in these topics and others. A vibrant, interactive group of students is very important to my professional life.

* * *

1988. (with A. Welsh and S.A. Altmann) The fallacy of averages. American Naturalist 132: 277-288.

1991. Gene flow in Scrub Jays (Aphelocoma coerulescens): frequency and direction of movement. Condor 93: 926-934.

1992. Phylogeny and rates of molecular evolution in the jays of the genus Aphelocoma (Corvidae). Auk 109: 134-148.

1992. (with S.M. Lanyon) New bird species, DNA studies, and type specimens: A commentary. Trends in Ecology and Evolution 7: 167-168.

1992. A phylogenetic analysis of social evolution in the Aphelocoma jays. Animal Behavior 44: 859-866.

1992. Philopatry and genetic differentiation in the Aphelocoma jays. Biological Journal of the Linnean Society 47: 249-260.

1993. Adaptive geographic variation of beak shape in Scrub Jays (Aphelocoma coerulescens). American Naturalist.

OLIVIER C. RIEPPEL

Curator, Fossil Amphibians and Reptiles; Lecturer, Committee on Evolutionary Biology, University of Chicago; Adjunct Professor of Biological Sciences, Northwestern University

Diploma, Zoology, University of Basle, 1974.
M.Sc., Vertebrate Paleontology, University College, London, 1975.
Ph.D., Zoology, University of Basle, 1978.

Foreign Member of the Linnean Society of London, 1992.
Council, Society of Systematic Biologists, 1994.
Associate Editor, Journal of Vertebrate Paleontology, 1993-1995.
Editorial Board, Zeitschrift für zoologische Systematik und Evolutionsforshung.
Editorial Board, Revue Suisse de Zoologie.

Comparative and functional anatomy, systematics and evolution of extant reptiles; comparative anatomy and phylogeny of fossil fishes and reptiles; history and philosophy of biology.

My research concentrates on the analysis of phylogenetic relationships of marine Mesozoic reptiles, mostly the Sauropterygia from the German Triassic (Muschelkalk). Parallel studies address problems of skeleton formation in all three major clades of extant reptiles (lizards, crocodiles and turtles), focusing on patterns and sequences of ossification. These developmental data provide the basis for a better understanding of skeletal reduction in secondary marine reptiles, such as the Sauropterygia. Studies in the philosophy and methodology of systematics and its relation to evolutionary theory have resulted in recent papers on problems of homology, historical and conceptual aspects of comparative biology, the meaning of cladistics in paleontoloty, and the species problem. A field program in the marine Middle Triassic of northwestern Nevada targets the collection of ichthyosaurs and sauropterygians, but has also led to the collection of associated rich and varied fossil fish faunas.

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1988. Fundamentals of Comparative Biology. Basel: Birkhauser Verlag, 202p.

1992. New Species of the genus Saurichthys (Pisces: Actinopterygii) from the Middle Triassic of Monte San Giorgio (Switzerland), with comments on the phylogenetic interrelationships of the genus. Palaeontographica, A221:63-94.

1992. Studies on skeleton formation in reptiles. III. Patterns of ossification in the skeleton of Lacerta vivipara Jacquin (Reptilia, Squamata). Fieldiana: Zoology, new series 68: 1-25. Chicago.

1992. Homology and logical fallacy. Journal of Evolutionary Biology, Basel, 5: 701-715.

1993. Patterns of Diversity in the Reptilian Skull. In: The Vertebrate Skull, J. Hanken and B.K. Hall (eds.). The University of Chicago Press, Chicago.

1993. Middle Triassic Reptiles from Monte San Giorgio: recent results and future potential of analysis. In: Evolution, Ecology and Biogeography of Triassic Reptiles, G. Pinna and J.M. Mazin (eds.). Museo Civico di Storia Naturale, Milan.

1993. Studies on skeleton formation in reptiles. IV. The homology of the reptilian (amniote) astragalus revisited. Journal of Vertebrate Paleontology.

ROBERT G. STOLZE

Associate Curator, Pterodphytes

B.S., University of Notre Dame, 1949.

Co-PI on NSF grant: Pteridophyta of Peru (1986-1988).
Member, American Fern Society.
Member, Botanical Society of America.

Taxonomy and systematics of ferns and fern allies in Peru and Ecuador.

Pteridophytes are the vestiges of ancient evolutionary lines that provide valuable information about the past and allow interpretation of more recent evolutionary lines. My research focuses on gaining knowledge about the species, evolution and relationships of pteridophytes. Currently, I am working to provide keys to identification of the ferns and fern allies in Peru and Ecuador, and to provide comparison of species relationships, habitats, distribution and assessment of patterns of evolution. I am finishing a 6-year project "Pteridophyta of Peru" being co-authored with Professor Rolla M. Tryon, of Harvard University. Upon completion, about 100 genera and 1000 species will have been treated, and a comprehensive index and phytogeography of the region will appear. In addition, I have just completed a treatment of 55 species of the tropical fern genus Diplazium for the Flora of Ecuador.

* * *

1974. A taxonomic revision of the genus Cnemidaria (Cytheaceae)., Fieldiana 37: 1-98.

1978. A new species of Asplenium from Guatamala. American Fern Journal 67: 40-44.

1983. Ferns and Fern Allies of Guatamala (Marsileaceae, Salviniaceae and the fern allies), Fieldiana: Botany, new series 12: 1-91.

1989. (with R. Tryon) Pteridophyta of Peru, Part I: Ophioglossaceae-Cyatheaceae. Fieldiana: Botany, new series 20: 1-145.

1990. Observations on Ctenitis (Dryopteridaceae) and allied genera in America. Annals of the Missouri Botanic Garden 77: 274-280.

1992. (with R. Tryon) Pteridophyta of Peru Part III: Thelypteridaceae, Fieldiana: Botany, new series 29: 1-80.

JANET R. VOIGHT

Assistant Curator, Invertebrates

B.S., Iowa State University, 1977.
Ph.D., University of Arizona, Ecology and Evolutionary Biology, 1990.

Travel Awards, American Malacological Union, 1991, 1993.
Smithsonian Fellowship in Systematic Malacology, Conchologists of America, 1988.
Award, Hawaiia Malacological Society.

Systematics and evolution of Incirrate octopods.

I am working to discover relationships among cephalopods of the world's oceans, especially the octopuses. Currently, work focuses on assessing the characters used in classification through rigorous quantitative methods. The identification of informative characters will allow me to discover relationships among benthic octopuses and to assess whether the present octopod suborders, defined by the presence or absence of fins, are products of evolution or are grouped because of superficial similarities. Preliminary work on relationships among the squids of the open oceans will be vital to furthering our knowledge of those morphologically and ecologically diverse predators.

* * *

1988. Trans-Panamanian geminate Octopods (Mollusca:Octopoda). Malacologia 29: 289-294.

1991. Ligula length and courtship in Octopus digueti: A potential mechanism of mate choice. Evolution 45(7): 1726-1730.

1991. Enlarged suckers as an indicator of male maturity in Octopus. Bulletin of Marine Science 49: 98-106.

1992. Movement, injuries and growth of members of a natural population of the Pacific pygmy octopus, Octopus digueti. Journal of Zoology London Society 228: 247-263.

1993. The association between distribution and octopodid morphology: Implications for classification. The Zoological Journal of the Linnean Society.

HAROLD K. VORIS

Curator, Amphibians and Reptiles; Lecturer, Committee on Evolutionary Biology, University of Chicago

B.A., Biology, Hanover College, 1962.
Ph.D., Biology Department, University of Chicago, 1969.

Scientific Editor, Fieldiana.
Hanover College Alumni Achievement Award, 1983.

Ecology and systematics of marine snakes/coevolution of pedunculate barnacles and decapod crustaceans/comparisons of old-world tropical rain forest amphibian and reptile communities.

I am currently pursuing three research topics, all based in southeast Asia and all collaborative projects. In the lowland tropical rain forests of Borneo, Bob Inger and I are studying the natural changes in communities of amphibians and reptiles that occur over time and differences in these communities that occur from place to place. This year comparisons between logged forests and undisturbed forests are adding another dimension to the comparisons.

In the Pulau Tiga marine park off the north coast of Borneo, Rob Stuebing and I, along with several students, are exploring the ecology of the banded sea krait, an amphibious sea snake. Our plan is to begin to investigate the plasticity in several life history traits over its huge geographic range that straddles the equator.

In the Straits of Johore between Malaysia and Singapore and in Thailand we (Jeffries, Voris and Yang) are trying to understand the degree to which coevolution has occurred in a symbiotic relationship that exists between pedunculate barnacles, on the one hand, and crabs and snakes, on the other. Recently our work on the mechanisms of colonization of the edible crab by barnacles was completed and we are now looking at timing factors.

I would welcome the opportunity to help guide student research projects that pertain to topics generally related to the research described above.

***

1979. (with W. B. Jeffries) Observations on the relationship between Octolasmis grayii (Darwin, 1851) (Thoracica, Cirripedia) and certain marine snakes (Hydrophiidae). Crustaceana 37(2): 123-132.

1981. (with C.A. Lemen) A comparison of reproductive strategies among marine snakes. Journal of Animal Ecology 50: 89-101.

1983. (with H.H. Voris) Feeding strategies in marine snakes: an analysis of evolutionary, morphological, behavioral and ecological relationships. American Zoologist 23(2): 411-425.

1986. (with R.F. Inger and K.J. Frogner) Organization of a community of tadpoles in rain forest steams in Borneo. Journal of Tropical Ecology 2: 193-205.

1989. (with W.B. Jeffries and C.M. Yang) A new mechanism of host colonization: pedunculate barnacles of the genus Octolasmis on the mangrove crab, Scylla serrata. Ophelia 31(1): 51-58.

1990. (with R. Stuebing) Relative abundance of marine snakes on the west coast of Sabah. Journal of Herpetology 24(2): 201-202.

MARK W. WESTNEAT

Assistant Curator, Fishes

B.A., Biology, The College of Wooster, 1984.
Ph.D., Zoology, Duke University, 1990.

D. Dwight Davis Award, American Society of Zoologists, 1990.
Raney Award in Ichthyology, American Society of Ichthyologists and Herpetologists, 1988.
Field Work in the Coral Sea.

Functional morphology of vertebrates, with emphasis on behavioral kinetics and muscle physiology during feeding and locomotion.

Current studies address the integration of phylogenetic systematics with comparative biomechanics and functional morphology. My research goals in systematics include the resolution of relationships among species and higher level taxa in the fishes of the tropical, marine family Labridae (the wrasses). Character analysis of labrid fishes to date has followed a traditional morphological focus, but data are now being sought from color patterns, behavior, function, and perhaps molecules in an attempt to establish a broad character data base to aid tree construction among the 600 labrid species. The functional morphology of feeding and locomotion in living fishes is being studied by high speed film and video analysis of behavior. Using comparative anatomy, theory from mechanical engineering, and new image and motion analysis techniques, the musculoskeletal mechanisms of feeding and swimming are being described in fishes of the Labridae, Carangidae, and Scombridae. The goal is to document the mechanisms of force transfer from muscle through connective tissue to skeleton in feeding and locomotor systems. Combined with a phylogenetic hypothesis, this research program tries to clarify the patterns of evolution of functional systems in fishes.

* * *

1990. Feeding mechanics of teleost fishes (Labridae: Perciformes): A test of four-bar linkage models. Journal of Morphology 205: 269-295.

1991. Linkage biomechanics and evolution of the jaw protrusion mechanism of the sling-jaw wrasse, Epibulus insidiator. Journal of Experimental Biology 159: 165-184.

1992. (with W.G. Hall) Ontogeny of feeding motor patterns in infant rats: an electromyographic study of suckling and chewing. Behavioral Neuroscience 106: 539-554.

1992. (with S. Nowicki and W. Hoese) Birdsong: motor function and the evolution of communication. Seminars in the Neurosciences 4: 385-390.

1993. Systematics and biomechanics in ecomorphology. In Luczkovich, J., Motta, P., and S. Norton, eds. Symposium on the ecomorphology of fishes Environmental Biology of Fishes.

1993. (with W. Hoese, C. A. Pell, and S. A. Wainwright) The horizontal septum: mechanisms of force transfer in the locomotion of scombrid fishes (Scombridae, Perciformes). Journal of Morphology.

1993. (with J. H. Long, B. Hoese and S. Nowicki) Kinematics of birdsong in sparrows: functional correlates of beak and head motion. Journal of Experimental Biology.

1993. A phylogenetic hypothesis for the tribe Cheilinini (Labridae: Perciformes. In: Proceedings of the ASIH symposium on Percomorph phylogeny, D. Johnson (ed.). Bulletin of Marine Science.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

1992 PUBLICATIONS

(excluding abstracts)

DEPARTMENT OF BOTANY

William Burger

Parapatric close-congeners in Costa Rica: Hypothesis for pathogen-mediated plant distribution and speciation. Biotropica 24: 567-570.

Michael O. Dillon

(with A. Sagastegui) Sinopsis de los Generos de Gnaphaliinae (Asteraceae-Inuleae) de Sudamerica. Arnaldoa 1(2): 5-91.

John J. Engel

Index Hepaticarum Supplementum: 1984-1985. Taxon 41: 253-306.

Studies on Geocalycaceae (Hepaticae). VIII. A revision of Chiloscyphus subg. Notholophocolea (Schust.) Engel & Schust. Journal of the Hattori Botanical Laboratory 72: 105-115.

Studies on Geocalycaceae (Hepaticae). VII. Subspecific differentiation of Chiloscyphus semiteres together with further refinements in Chiloscyphus (s. lat.). Contributions University Michigan Herbarium 18: 107-111, fig. 1.

Nancy Henshold

(with T.G. Lammers) Chromosome numbers of Campanulaceae. II. The Lobelia tupa complex of Chile. American Journal of Botany 79: 585-588.

Thomas G. Lammers

Circumscription and phylogeny of the Campanulales. Annals of the Missouri Botanical Garden 79: 388-413.

(with N. Hensold) Chromosome numbers of Campanulaceae. II. The Lobelia tupa complex of Chile. American Journal of Botany 79: 585-588.

Two new combinations in the endemic Hawaiian genus Cyanea (Campanulaceae: Lobelioideae). Novon 2: 129-131.

New combinations for Asian Campanulaceae. Botanical Bulletin of Academia Sinica 33: 285-287.

(with T. F. Stuessy) Lectotypification of Lactoris fernandeziana Philippi (Lactoridaceae). Taxon 41: 537-540.

Systematics and biogeography of the Campanulaceae of Taiwan. In: Phytogeography and Botanical Inventory of Taiwan, C.-I Peng (ed.), pp. 43-61. Institute of Botany, Academia Sinica, Taipei.

Gregory Mueller

Systematics of Laccaria (Agaricales) in the continental United States and Canada, with discussions on extralimital taxa and descriptions of extant types. Fieldiana: Botany, new series 30: 1-158.

(with B. Strack) Evidence for a mycorrhizal host shift during migration of Laccaria trichodermophora and other agarics into neotropical oak forests. Mycotaxon 45: 249-256.

(with R. H. Petersen) New South American taxa of Cantharellus, C. nothofagorum, C. xanthoscyphus, and C. lateritius var. colombianus. Boletin de la Sociedad Argentina de Botanica 28: 6 pp.

(with M. Blackwell) NSF funding in systematics. Inoculum, Newsletter of the Mycological Society of America 43(1): 4-8.

Robert G. Stolze

(with R. Tryon) Pteridophyta of Peru, Part III: Thelypteridaceae, Fieldiana: Botany, new series 29: 1-80

Nancy E. Walsh

(with D. Charlesworth) Evolutionary interpretations of differences in pollen tube growth rates. The Quarterly Review of Biology 67: 19-37.

Quixin Wu

Mating tests and systematics in higher Basidiomycetes. Acta Mycologica Sinica 11(4): 249-257.

(with R.H. Petersen) A new species of Clavicorona from Japan. Mycotaxon 45: 123-129.

(with R.H. Petersen) Morphological and mating studies on Asian Clavicorona. Mycosystema 4: 33-44.

(with R.H. Petersen) Auriscalpium vulgare: mating system and biological species. Mycosystema 4: 25-31.

DEPARTMENT OF GEOLOGY

John R. Bolt

(with R. E. Lombard) Nature and quality of the fossil evidence for otic evolution in early tetrapods. In: The Evolutionary Biology of Hearing, A. Popper, R. Fay, and D. Webster (eds.), pp. 377-403. Springer Verlag.

Ignacio Casanova

Osbornite and the distribution of titanium in enstatite meteorites. Meteoritics 27: 208-209.

Wavelength shift in electron microprobe analysis of Al, Si, P and S in geological materials. IV Congreso Geoquimica de Espana (in Spanish, with English abstract), 800-806.

(with L. J. Perdiguero) Relationships between chondritic and iron meteorites. IV Congreso Geoquimica de Espana, 865-872.

(with T. L. Dickinson, and G. E. Lofgren) High-temperature reduction of silicon in enstatite meteorites: evidence from the experimental studies of Indarch. Lunar Planet. Sci. XXIII: 309-310.

Peter R. Crane

(with P.S. Herendeen) Early caesalpinioid fruits from the Palaeogene of southern England. In: Advances in Legume Systematics IV: Fossil Leguminosae, P. S. Herendeen and D. L. Dilcher (eds). Royal Botanic Gardens, Kew.

(with E.M. Friis and K.R. Pedersen). Esgueria gen. nov., fossil flowers with combretaceous features from the Late Cretaceous of Portugal. Biologiske Skrifter 41: 1-45.

(with S. Lidgard) Fifth North American Paleontological Convention. Abstracts and Program. The Paleontological Society. Special Publication 6. xxii + 329 pp.

Lance Grande

(with W.E. Bemis) Early development of the actinopterygian head. I. General observations and comments on staging of the paddlefish Polyodon spathula. Journal of Morphology 213:47-83.

The Tertiary Green River Lake Complex, with comments on paleoenvironments and historical biogeography. Symposium volume on Early Tertiary Paleontology and Environments in Wyoming. Contributions to Geology 30(1).

(with P. Buchheim) Paleontological and sedimentological variation in Early Eocene Fossil Lake. Symposium volume on Early Tertiary Paleontology and Environments in Wyoming. Contributions to Geology 30(1).

Scott Lidgard

(with Peter R. Crane) Fifth North American Paleontological Convention. Abstracts and Program. The Paleontological Society. Special Publication 6 xxii + 329 pp.

Matthew H. Nitecki

(with D.V. Nitecki) (eds.) History and Evolution. SUNY Press.

Cyclocrinites spaskii --a model of cyclocrnitid morphology. Inst. Geol. Univ. Oslo. Int. Skrift. 63: 1-69.

Evolution. Quarterly Review of Biology 67(2): 205-6.

(with N. Spjeldnaes) Preservation of organisms in the Ordovician lithographic limestones of the Baltic Region. Geoblos. Mem. Sp. 1, p. 37.

History: la grande illusion. In: History and Evolution, M.H. Nitecki and D.V. Nitecki (eds.), pp. 3-15. SUNY Press.

Olivier C. Rieppel

New species of the genus Saurichthys (Pisces: Actinopterygii) from the Middle Triassic of Monte San Giogio (Switzerland), with comments on the phylogenetid interrelationships of the genus. Palaeontographica, A 221: 63-94.

Studies on skeleton formation in reptiles. III. Patterns of ossification in the skeleton of Lacerta vivipara Jacquin (Reptilia, Squamata). Fieldiana: Zoology, new series, 68: 1-25. Chicago.

Homology and logical fallacy. Journal of Evolutionary Biology, Basel, 5: 701-715.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Gastropod phylogeny and systematics. Annual Review of Ecology and Systematics 23: 311-338.

Tenagodus or Siliquaria? Unraveling taxonomic confusion in marine "worm-snails" (Cerithioidea: Siliquariidae). The Nautilus 106(1): 15-20.

(with P.M. Mikkelsen) Preliminary phylogenetic analysis of the bivalve family Galeommatidae, with a discussion of taxonomic characters. American Malacological Bulletin 9(2): 157-164.

(with P.M. Mikkelsen) (eds.) Handbook of Systematic Malacology, Part 1 (Loricata [Polyplacophora]; Gastropoda: Prosobranchia). Smithsonian Institution and National Science Foundation, xviii + 625 pp., 470+1 text-fig. (Annotated English-language edition of: Thiele, J., Handbuch der systematischen Weichtierkunde, Teil 1).

(with P.M. Mikkelsen) (eds.) Handbook of systematic Malacology, Part 2 (Gastropoda: Opisthobranchia, Pulmonata). Smithsonian Institution and National Science Foundation, text-figs. 471-782 (Annotated English-language edition of: Thiele, J., Handbuch der systematischen Weichtierkunde, Teil 2).

(with P.M. Mikkelsen) Biology and comparative anatomy of three new species of commensal Galeommatidae, with a possible case of mating behavior in bivalves. Malacologia 34(1-2): 1-24.

Barry Chernoff

(with J.G. Lundberg) A Miocene fossil of the amazonian fish Arapaima (Teleostei, Arapaimidae) from the Magdalena River region of Colombia -- biogeographic and evolutionary implications. Biotropica 24(1): 2-14.

(with A. Machado-Allison and R. Royero-León) Sistemica y biogeografía de los peces del Rio Atabapo de Amazonas, Venzuela. Acta Venezolana 42(1): 1-21.

Lawrence Heaney

(with G.C. Musser) Philippine rodents: Definitions of Tarsomys and Lymnomys plus a preliminary assessment of phylogenetic patterns among native Philippine murines (Murinae, Muridae). Bulletin of the American Museum of Natural History 206: 145-167.

Robert F. Inger

Variation in apomorphic characters in the stream-dwelling tadpoles of the bufonid genus Ansonia. Zoological Journal of the Linnean Society 105: 225-237.

A biphasic feeding system in a stream-dwelling larval form of Rhacophorus from Borneo. Copiea 1992: 887-890.

Julian Kerbis

(with L.K. Horwitz) A bone assemblage from a striped Hyaena (Hyaena hyaena) den in the Negev Desert, Israel. Israel Journal of Zoology 37: 225-245.

Scott Lanyon

Of birds and their molecules: A review of Sibley and Ahequist. Condor 94: 304-310.

(with A. T. Peterson) New bird species, DNA studies, and type specimens: A commentary. Trends in Ecology and Evolution 7: 167-168.

Interspecific brood parasitism in blackbirds (Icterinae): A phylogenetic perspective. Science 225: 77-79.

Alfred F. Newton

(with S.A. Johnson, R. W. Lundgren, M. K. Thayer, R. L. Wenzel and M. R. Wenzel) Mazur's World Catalogue of Histeridae: emendations, replacement names for homonyms and an index. Polskie Pismo Entomologiczne 61(2): 1-100.

(with M. K. Thayer) Current classification and family-group names in Staphyliniformia (Coleoptera). Fieldiana: Zoology, new series 67: 1-92.

(with B. Burakowski) The immature stages and bionomics of the myrmecophile Thoracophorus corticinus Motschulsky, and placement of the genus (Coleoptera, Staphylinidae, Osoriinae). Annali del Museo Civico di Storia Naturale "G. Doria" 89: 17-42.

Técnicas para la elaboración de preparaciones permanentes y temporales de Coleópteros pequenos. [Translation and appendix by J. L. Navarrete-Heredia]. Boletín Mexicana de Entomología 10: 11-13.

(with M.K. Thayer and C.W. Sabrosky) Case 2786. Tachinidae Fleming, 1821 (Insecta: Coleoptera) and Tachinidae Robineau-Desvoidy, 1830 (Insecta: Diptera): proposed removal of homonymy, and Tachyporidae MacLeay, 1825 (Insecta: Coleoptera): proposed precedence over Tachinusidae Fleming, 1821. Bulletin of Zoological Nomenclature 49: 122-126.

(with M.K. Thayer and T. Pape) Case 2793. Metopiinae Foerster, 1868 (Insecta: Hymenoptera), Metopiini Raffray, 1904 (Insecta: Coleoptera), and Metopiini Townsend, 1908 (Insecta: Diptera): proposed removal of homonymy. Bulletin of Zoological Nomenclature 49: 200-204.

Comment (3) on the proposed conservation of the generic name Helophorus Fabricius, 1775 (Insecta, Coleoptera) as the correct original spelling (Case 2796; see BZN 49: 30-31). Bulletin of Zoological Nomenclature 49: 231.

(with M.K. Thayer) Specimen databases as research tools. Insect Collection News 8: 6-7.

Bruce D. Patterson

Mammals in the Royal Natural History Museum, Stockholm, collected in Brazil and Bolivia by A. M. Olalla during 1934-1938. Fieldiana: Zoology, new series 66: 1-48.

Ornithological gazetteer of Brazil [book review]. Journal of Mammology 73: 462-463.

A new genus and species of long-clawed mouse (Rodentia: Muridae) from temperate rainforests of Chile. Zoological Journal of the Linnean Society 106: 127-145.

(with V. Pacheco) Systematics and biogeographic analyses of four species of Sturnia (Chiroptera: Phyllostomidae), with emphasis on Peruvian forms. In: Biogeografía, ecología, y conservación del bosque montano en el Perú, K.R. Young and N. Valencia (eds.), pp.57-81. Mem. Mus. Hist. Nat., Univ. Nac. May. San Marcos 21.

(with V. Pacheco and M.V. Ashley) On the origins of the Western Slope region of endemism: systematics of fig-eating bats, genus Artibeus. In: Biogeografía, ecología, y conservación del bosque montano en el Perú, K.R. Young and N. Valencia (eds.), pp.189-207. Mem. Mus. Hist. Nat., Univ. Nac. May. San Marcos 21.

A. Townsend Peterson

(with S.A.G. Navarro, P. Escalante, P. and H. Benitez D.) Cypseloides storeri: a new species of swift from Mexico. Wilson Bulletin 104: 55-64.

(with S.A.G. Navarro and P. Escalante, P.) Genetic differentiation among Mexicanpopulations of Chestnut-capped Brush-finches (Atlapetes brunneinucha) and Common Bush-tanagers (Chlorospingus ophthalmicus). Condor 94: 242-251.

Phylogeny and rates of molecular evolution in the jays of the genus Aphelocoma (Corvidae). Auk 109: 134-148.

(with P. Escalante P.) Species limits in the hummingbird genus Thalurania. Wilson Bulletin 104: 205-219.

(with S.A.G. Navarro and P. Escalante P.) New distributional information on Mexican birds. I. The Sierra de Atoyac, Guerrero. Bulletin of the British Ornithologists' Club 112: 6-11.

Phylogeny and classification of birds: a study in molecular evolution [review]. Ibis 134: 204-206.

(with S. M. Lanyon) New bird species, DNA studies, and type specimens: A commentary. Trends in Ecology and Evolution 7: 167-168.

Janet R. Voight

Movement, injuries and growth of members of a natural population of the Pacific pygmy octopus, octopus digueti. Journal of Zoology London Society 228: 247-263.

Octopus gardening. In the Field Bulletin of the Field Museum of Natural History.

Harold K. Voris

(with W. B. Jeffries and S. Poovachiranon) Age of the mangrove crab, Scylla serrata, at colonization by stalked barnacles of the genus Octolasmis. The Biological Bulletin.

Mark W. Westneat

(with W. G. Hall) Ontogeny of feeding motor patterns in infant rats: an electromyographic study of suckling and chewing. Behavioral Neuroscience 106: 539-554.

(with S. Nowecki and W. Hoese) Birdsong: motor function and the evolution of communication. Seminars in the Neurosciences 4: 385-390.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

MUSEUM AND PUBLIC SERVICE (EDITORSHIPS, COMMITTEE ASSIGNMENTS, ETC.), 1992

DEPARTMENT OF BOTANY

John J. Engel

Flora North America Editorial Committee; Systematics Agenda 2000, Committee Member; Council Member, International Association of Bryologists; Chair, Field Museum Publications Committee; Supervisor, Scientific Illustrators.

Thomas G. Lammers

Editorial Coordinator, volume of Flora of the Greater Antilles; Chair, Publicity Committee, American Society of Plant Taxonomists; Editorial Board, American Society of Plant Taxonomists Newsletter; Education Committee, Botanical Society of America; Standing Committee for Botany, Pacific Science Association.

Gregory M. Mueller

Mycological Association of America, liason with National Institute for the Conservation of Cultural Property, Washington, D.C.; Committee on Inter-Society Liaison, North American Mycological Society; Chair, Editorial Committee, North American Mycological Society; Survey and Inventory Panel, Systematic Biology Program, National Science Foundation.

DEPARTMENT OF GEOLOGY

Ignacio Casanova

Associate Editor, Proceedings IV Congress, Geochemistry, Spain.

Peter R. Crane

Co-convener, Fifth North American Paleontological Convention; Panel Systematic Biology Program, National Science Foundation; Member Editorial Board, International Journal of Plant Science; Member Editorial Board, Plant Systematics and Evolution; Member Review Panel, Kew Bulletin; Member Editorial Board, Review of Palaeobotany and Palynology; Associate Editor, Paleobiology; "Systematics Agenda 2000", Committee Member; Botanical Society of America Management Committee.

John J. Flynn

Systematics Agenda 2000; Co-Chair of "Earth History and Global Change" Committee; Fifth North American Paleontological Convention, Organizing Committee; International Union of Geological Sciences, Working Group on "Stratigraphic correlation of marine and continental records", Member; International Geological Correlation Program, IGCP Project 308: "Paleocene/Eocene boundary events", Specialty Coordinator (Vertebrates); Society of Vertebrate Paleontology, Collections Computerization Committee; Society of Vertebrate Paleontology, Meeting Liason Officer; Member Romer Prize Committee, Society of Vertebrate Paleontology; Chair, Field Museum Science Advisory Council.

Lance Grande

Councillor, Society of Systematic Biology; Editorial Board, Revista; Member of Romer Prize Committee, Society of Vertebrate Paleontology; Member of Committee on Fish Classification, American Society of Ichthyologists and Herpetologists; "Systematics Agenda 2000" Committee Member; Chair, Field Museum Scholarship Committee.

Scott Lidgard

Chair, Association of North American Paleontological Societies; Co-convener, Fifth North American Paleontological Convention; Membership Committee, Paleontological Society; Governing Council International Bryozoological Association; CEEB Coordinator for university teaching; Field Museum representative, University of Chicago, Biological Sciences Governing Committee.

Matthew H. Nitecki

Editor, Paleontological Journal.

Olivier C. Rieppel

Associate Editor, Zeitschrift fur Zoologische Systematische und Evolutions forschung; Associate Editor, Revue Suisse de Zoologie; Associate Editor, Journal of Vertebrate Paleontology; Member, International Herpetological Committee; Council Member, Society for Systematic Biology; Foreign Member of the Linnean Society of London; Member, Visiting Group, Department Paleontology, The Natural History Museum, London.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Editor-in-Chief, Monographs of Marine Mollusca; Managing Editor, Nemouria, Occasional Papers of the Delaware Museum of Natural History; Scientific Editor, Smithsonian Institution Translations Publishing Program; Editorial Board Member, Malacologia, International Journal of Malacology; Editorial Board Member, The Nautilus; Secretary, Council of Systematic Malacologists; Organizer, International Symposium on Caribbean Mollusks, Sarasota, Florida, 1992; Coordinator for the 'Lower Heterobranch' gastropod section of Treatise on Invertebrate Paleontology; American Malacological Union (AMU representative to UNITAS, also endowment and student award committees).

Barry Chernoff

Editorial Board, Fishes of the Western North Atlantic; Board of Govenors, American Society of Icthyologists and Herpotologists; "Systematics Agenda 2000," Committee Member.

Robert F. Inger

Board of Trustees, Illinois Chapter, The Nature Conservancy.

Lawrence R. Heaney

Board of Directors, American Society of Mammalogists; Science Advisor, Center for Tropical Conservation Studies, Silliman University, Philippines.

Scott M. Lanyon

Chair, American Ornithologists' Union Collections Committee; Member, American Ornithologists' Union Ornithology and the Law Committee; Member, American Ornithologists' Union Conservation Committee; Member, American Ornithologists' Union Membership Commitee; Member, ICBP-US Grant Awards Committee; Supervisor, Field Museum Biochemistry Laboratories.

Alfred F. Newton, Jr.

Councillor, Coleopterists Society.

Bruce D. Patterson

Editor for Reviews, Journal of Mammalogy; Editorial Board, Biodiversity Letters; American Society of Mammalogists, Board of Directors; American Society of Mammalogists, Editorial Committee; American Society of Mammalogists, C. Hart Merriam Award Committee

A. Town Peterson

Editorial Committee Member, Miscellaneous Publications of the Museo de Zoologia, Facultad de Ciencias, UNAM, Mexico; Editorial Committee Member, Anales del Instituto de Biologia, UNAM, Mexico; American Ornithologists' Union and Field Museum Representative to I.C.B.P.

Janet R. Voight

Chair, Membership Committee, American Malacological Union; Coordinator Field Museum Systematics Discussion Group

Harold K. Voris

Scientific Editor, Fieldiana

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

ACTIVE GRANTS, 1992

DEPARTMENT OF BOTANY

Michael O. Dillon

National Geographic Society: "Floristic Inventory of Humid Upper Montane Forests of Northern Peru", $18,950 NGS 4510-91 (1991-1993)

John J. Engel

National Science Foundation: "Curatorial Support for the Field Museum Herbarium," $655,153 DEB-9021960 (1991-1994)

DEPARTMENT OF GEOLOGY

John R. Bolt

National Science Foundation: "Renovation of Paleontological Research Facilites at Field Museum of Natural History." $375,000 RFO 90-21856 (1991-1992), (with J. J. Flynn).

National Science Foundation: "Mississippian Fossil Tetrapods from Midcontinental USA and Early-Tetrapod Phylogeny." $20,000 DEB 9207475 (1992-1994), (with R. E. Lombard).

Peter R. Crane

National Science Foundation: "Systematics, Floral Structure and Reproductive Biology of Mid-Cretaceous Magnoliid Angiosperms." $210,923 DEB 9020237 (1991-1994).

National Science Foundation: "Major patterns in the Phylogeny of Flowering Plants: Floral Development and Relationships among basal Non-Magnoliid Deicotyledons" $10,100 INT 9015123 (1991-1993).

National Science Foundation: "Support for NAPC.V - The Fifth North American Paleontological Convention" $20,600 EAR 9118344 (1991-1992), (with S. Lidgard, S. Kidwell, M. LaBarbera, R. Plotnick).

Petroleum Research Fund, American Chemical Society: "Global Patterns of Cretaceous Vegetational Change" $40,000 PRF 24025-AC8 (1990-1992), (with S. Lidgard).

National Science Foundation: "Doctoral Dissertation Improvement Award to Jane Masterson" $4,801 DEB 9112358 (1992-1993).

John J. Flynn

National Science Foundation: "Renovation of Paleontological Research Facilites at Field Museum of Natural History." $375,000 RFO 90-21856 (1991-1992), (with J. J. Flynn).

National Science Foundation: "Collaborative Research: A New Paleogene Fauna from the Chilean Andes: A Critical Interval in South American Faunal History", Sub Contract $18,552.

National Science Foundation: "Collaborative Research: A New Paleogene Fauna from the Chilean Andes: A Critical Interval in South American Faunal History", Sub Contract $15,000.

Geological Society of America: Attendance at 29th International Geological Congress, Travel Grant $2,000.

Lance Grande

National Science Foundation: "Systematics, ontogeny, osteology and historical biogeography of living and fossil bowfins (Actinopterygii: Amiiformes), (with W. Bemis), $226,638 DEB-9119561 (1993-1995).

Scott Lidgard

National Science Foundation: "Comparing Zooid and Colony Evolution in a Modular Organism: Phylogeny and Morphometry in the Cenozoic bryozoan Adeonellopsis" ($61,519). DEB 9006983 (1990-1993).

National Science Foundation: "Support for NAPC.V - the Fifth North American Paleontological Convention" (with P.R. Crane, S. Kidwell, M. LaBarbera, R. Plotnick), $20,600. EAR 9118344 (1991-1992).

Olivier M. Rieppel

National Geographic Society: "Vertebrates of Triassic Coastal Environments from North America" $7,790 NGS 4872-92.

National Science Foundation: "Phylogenetic Relationships of the Sauropterygia (Reptilia: Diapsida)", $57,125. DEB-9220540 (1992-1994).

DEPARTMENT OF ZOOLOGY

Barry Chernoff

National Science Foundation: "Support for Computerization and Expansion of Ichthyology COllection of the FIeld Museum of Natural History", $352.846. BSR9012652 (1991-1994).

Lawrence R. Heaney

The John D. and Catherine T. MacArthur Foundation: "Conservation of Mammalian Diversity in the Philippines", $295,000, (1990-1993).

Robert F. Inger

The John D. and Catherine T. MacArthur Foundation: "Processes Affecting Variation of Anuran Communities in Banean Forests", $175,000, WER GA90-9833 (1990-1993).

John D. Kethley

National Science Foundation: "Support for the Care and Use of the Collections of Insects and Other Arthropods of the Field Museum of Natural History", $710,047. DEB 8814449 (1989-1994).

Scott M. Lanyon

National Science Foundation: "Collection Computerization in the Division of Birds (Phase II) (with D.E.Willard, P.E. Lowther), $386,725. DEB 9114760 (1992-1996).

Institute of Museum Services: "Conservation Program", $25,000. IC 2035-92 (1992-1993).

Alfred F. Newton, Jr.

National Science Foundation: "Support for the Care and Use of the Collections of Insects and Other Arthropods of the Field Museum of Natural History", $710,047. DEB 8814449 (1989-1994).

Bruce D. Patterson

National Science Foundation: "Support for the primate facility at Field Museum of Natural History", Anthropology, PI (with J. Fooden and J. Haas as co-PIs), $25,537 BNS 9204356 (1992-1994).

National Science Foundation: "Facilities Support for the Mammal Collection, Field Museum of Natural History", $284,066 BSR 8821834 (1989-1992).

National Science Foundation: "SGER: Nested Patterns of Species Composition in Ecological Communities", $26,000 BSR 9106981 (1991-1992).

National Science Foundation: "Support for the involvement of minority undergraduates in collection management at Field Museum," Supplement to DEB-8821834, (with J. C. Kerbis and others as co-PIs), $80,352 (1992).

A. Town Peterson

National Science Foundation: "Terrestrial Vertebrate Faunas of the Humid Montane Forests of Oaxaca: An Intensive Biological Survey and Geographic Analysis", $169,341 DEB 9200863 (1992-1995).

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

SCIENTIFIC TRAVEL, 1992

DEPARTMENT OF BOTANY

John J. Engel -- St Louis, Fall Systematics Symposium, Missouri Botanical Garden

Thomas G. Lammers -- Claremont, California, Eighth Annual Southwestern Systematics Symposium, Rancho Santa Ana Botanic Garden; Honolulu, American Institute of Biological Sciences; St. Louis, Fall Systematics Symposium, Missouri Botanical Garden; Taiwan, ROC-USA Symposium on Phytogeography and Botanical Inventory of Taiwan; University of British Columbia; University of Wisconsin, Whitewater

Gregory M. Mueller -- Beltsville, Maryland, National Fungus Collections; Mississippi, Gulf Coast States Mycological Foray, Gulfport; St. Louis, Fall Systematics Symposium, Missouri Botanical Garden; Mycological Society of America, Portland; fieldwork, Costa Rica

DEPARTMENT OF GEOLOGY

Ignacio Casanova -- Copenhagen, Denmark, Annual Meeting of the Meteoritical Society; Houston, Texas, 23rd Lunar and Planetary Science Conference; St. Louis, Washington University

Peter R. Crane -- Melbourne, Australia, collaborative research, University of Melbourne; Brisbane, Queensland, collaborative research, University of Queensland; College Park, Maryland, University of Maryland; Amherst, Massachusetts, University of Massachusetts; St. Louis, Missouri, Missouri Botanical Garden, Annual Systematics Symposium; Columbus, Ohio, Ohio State University; Paris, France, 4th International Organization of Paleobotany Conference; Stockholm, Sweden, Swedish Museum of Natural History and University of Stockholm; Cincinnati, Ohio, Geological Society of America Annual Meeting; London, Natural History Museum

John J. Flynn -- Cincinnatti, Ohio, Geological Society of America; Kyoto, Japan, International Geological Congress; Toronto, Canada, Society of Vertebrate Paleontology; Wyoming, Field Work

Lance Grande -- Brussels, Belgium, Institut Royal des Sciences Naturelles de Belgique; London, U.K. British Museum of Natural History; Amherst, Massachusetts, University of Massachusetts; Paris, France, Museum National d'Histoire Naturelle; 3rd Annual Conference on Fossil Resources, The National Parks Service

Scott Lidgard -- Cincinatti, Ohio, Geological Society of America Annual Meeting; London, U.K., International Bryozoology Association Meeting

Matthew H. Nitecki -- Oslo, Norway, fieldwork and University of Oslo; Stockholm, Sweden, Swedish Museum of Natural History; Moscow, Russia, Russian Academy of Sciences

Olivier C. Rieppel -- Nevada, fieldwork; McGill University, Montreal; University of Texas, Austin; Swiss Zoological Society, Geneva

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler -- Harbor Branch, Florida, Smithsonian Marine Station/Harbor Branch Oceanographic Institution; Collections Rome, Genoa; Turino, Italy; Workshop, University of California, Berkeley; American Malacological Union Meeting, Sarasota, Florida

Barry Chernoff -- Caracas, Venezuela, fieldwork; University of California, Berkeley; University of Illinois, Champaign - Urbana; Academy of Natural Sciences, Philadelphia; UNAM, Mexico City

Lawrence R. Heaney -- Philippines, fieldwork and training; Utah, fieldwork; Salt Lake City, American Society of Mammologists, meeting

Robert F. Inger -- Borneo, fieldwork; Champaign - Urbana, Illinois, American Society of Ichthyologists & Herpetologists, meeting

John Kethley -- Fieldwork, mid-western and Gulf Coast U.S.; fieldwork, Hawaii; fieldwork, Australia

Scott M. Lanyon -- Iowa, American Ornithologists' Union meeting

Alfred F. Newton, Jr. -- Fieldwork, southern Texas; Fieldwork, southwestern Michigan; Baltimore, Maryland, Entomological Society of America meeting

Bruce D. Patterson -- Sao Paulo, Brazil, fieldwork and museum study; Salt Lake City, American Society of Mammalogists, meeting; Northern Illinois University, DeKalb, meeting

A. Town Peterson -- Philippines, fieldwork; Mexico, fieldwork

Janet R. Voight -- Chapel Hill, North Carolina, collections study; American Malacological Union Meeting, Sarasota, Florida

Harold Voris -- Thailand & Singapore, fieldwork

Mark Westneat -- Beaufort, North Carolina, Duke University Marine Laboratory, fieldwork; Champaign - Urbana, American Society of Ichthyologists & Herpetologists, meeting; American Society of Zoologists, meeting, Vancouver, Canada

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

CONTRIBUTIONS TO PUBLIC LEARNING

I. EXHIBITS, INFORMAL EDUCATION, SEMINARS ETC., 1992

DEPARTMENT OF BOTANY

William Burger

Exhibit Development: Africa.

Education Programs: Participation in Saturday morning education programs.

Michael O. Dillon

Tours, etc.: Michigan State University Plant Biology Group; Field Museum tour to Galapagos Islands and mainland Ecuador.

Seminars and Other Presentations: Michigan State University; Michigan Botanical Club (SW Chapter), Kalamazoo; 15th Annual Field Museum Spring Systematics Symposium; Institut de Recherche en Biologie Vegetale, Universite de Montreal, Montreal, Canada.

John J. Engel

Exhibit Development: AIDS Exhibit Co-Developer; "Art in Motion".

Seminars and Other Presentations: Participation in Teacher In-Service Workshops, Chicago State University; Field Museum Museology Class.

Thomas G. Lammers

Exhibit Development: Life Over Time

Field Trips: Field Museum tour to Amazonia and colonial Brazil

Seminars and Other Presentations: Field Museum Women's Board Spring Seminar; University of British Columbia; University of Wisconsin, Whitewater; Rancho Santa Ana Botanic Garden; American Society of Plant Taxonomists, Hawaii.

Gregory M. Mueller

Seminars and Other Presentations: Women's Board Spring Seminar; Mycological Society of America, Portland; Lake States Mycological Foray; Gulf Coast States Mycological Foray.

DEPARTMENT OF GEOLOGY

John R. Bolt

Exhibit Development: Life Over Time.

Ignacio Casanova

Education Programs: Four tours of meteorite collection; six tours of mineral/gem collection.

Seminars and Other Presentations: Washington University, St. Louis; University of Illinois at Chicago; 23rd Lunar and Planetary Science Conference, Houston; Annual Meteoritical Society Meeting, Copenhagen.

Peter R. Crane

Exhibit Development: Life Over Time; Eoraptor Temporary Exhibit; "Art in Motion".

Seminars and Other Presentations: North American Paleontological Convention, Field Museum; University of Massachusetts; University of Melbourne; University of Queensland; University of Maryland; Ohio State University; International Organization of Paleobotany, Paris; Missouri Botanical Garden, St. Louis; University of Stockholm; Field Museum Women's Board.

John J. Flynn

Exhibit Development: Content Specialist, Life Over Time; Content Specialist, Moving Earth; "Animal Kingdom"; "Art in Motion".

Education Programs: Field Museum Founders' Council Lecture Series; Field Museum Education Department, lecture for high school students; University of Chicago, The Women's Board.

Seminars and Other Presentations: North American Paleontological Convention Field Museum; 29th International Geological Congress, Kyoto; Moderator,"Global change and Biodiversity--What does the Earth's past tell us about the present and future of our planet?", Field Museum Education Department.

Lance Grande

Exhibit Development: Developer, Locked in Stone; Life Over Time.

Tours, etc: National Park Service, Kemmerer, Wyoming.

Seminars and Other Presentations: 15th Annual Field Museum Spring Systematics Symposium; National Park Service, Kemmerer, Wyoming.

Scott Lidgard

Exhibit Development: Life Over TIme.

Seminars and Other Presentations: North American Paleontological Convention, Field Museum.

Matthew H. Nitecki

Seminars and Other Presentations: University of Moscow, University of Oslo.

Olivier M. Rieppel

Exhibit Development: Life Over Time.

Seminars and Other Presentations: Organizer, 15th Annual Field Museum Spring Systematics Symposium; University of Texas, Austin; McGill University, Montreal; North American Paleontological Convention; Swiss Zoological Society, Geneva.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Exhibit Development: Africa; "Animal Kingdom"; Life Over Time.

Seminars and Other Presentations: University of Chicago; American Malacalogical Union, Sarasota, Florida; UNITAS, Malacologia, Siena, Italy.

Barry Chernoff

Seminars and Other Presentations: University of California, Berkeley; University of Illinois, Champaign - Urbana; Academy of Natural Sciences, Philadelphia; UNAM, Mexico City; Field Museum's Women's Board; Universidad Central de Venezuela

Lawrence R. Heaney

Exhibit Development: "Animal Kingdom".

Robert Inger

Exhibit Development: "Animal Kingdom".

Seminars and Other Presentationss: Field Museum Women's Board; Founders' Council.

Scott M. Lanyon

Exhibit Development: "Animal Kingdom"; "Art in Motion".

Alfred F. Newton

Exhibit Development: Life Over TIme.

Bruce D. Patterson

Exhibit Development: "Animal Kingdom".

Seminars and Other Presentations: Indiana State University; Organizer and Participant NSF sponsored workshop, Deerfield, Illinois; American Society of Mammalogists, Utah; 12th Mid-West Conference on Population Biology, Northern Illinois University.

Janet R. Voight

Exhibit Development: Life Over Time; "Animal Kingdom"; Sea Mammals.

Tours, etc: Field Museum Tour Baja.

Education Programs: Participant in Natureworks.

Seminars and Other Presentations: North American Paleontological Convention, Field Museum; American Malacological Union, Sarasota, Florida.

Harold K. Voris

Tours, etc: Field Museum Tour, Borneo and Philippines

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

CONTRIBUTIONS TO PUBLIC LEARNING

II. UNIVERSITY/HIGH SCHOOL EDUCATION, 1992

DEPARTMENT OF BOTANY

Michael O. Dillon

Courses: Flowering Plant Diversity, Michigan State University (MSU); Botanical Classification and Phylogeny, MSU; Plant Systematics, MSU.

Graduate Students Advised: Todd Barkman, MSU; Chai Benli, MSU; Martha Case, MSU.

Thomas G. Lammers

Courses: Taxonomy and Systematics of Flowering Plants, University of Illinois at Chicago, (with D. Doel Soejarto).

Gregory M. Mueller

Graduate Students Advised: T. W. May, Monash University, Australia.

Interns: Meilee Chen, University of Chicago; Elizabeth Pine, Illinois Mathematics and Science Academy.

DEPARTMENT OF GEOLOGY

Ignacio Casanova

Intern: Jonathan Lilly, Yale University.

Peter R. Crane

Courses: Plant Paleontology, University of Chicago; The Diversity of Life Through Time, University of Chicago.

Graduate Students Advised: Yao Yiping, University of Chicago; Paul Markwick, University of Chicago; Jane Masterson, University of Chicago; Rick Lupia, University of Chicago.

Post-Doctoral Associates: Paul Kenrick; Sara Hoot.

John J. Flynn

Course: Directed Readings Course, "Mammalian Evolution", Northwestern University.

Graduate Students Advised: G. Buckley, Rutgers University; J. Guerrero-Diaz, Duke University; W. Stevens, University of Chicago; P. Austin, University of Illinois at Chicago; T. Gaudin, University of Chicago; J. Alroy, University of Chicago.

Interns & Work/Study: Mary Wisz, University of Illinois at Chicago; Johanna Lombard, University of Chicago; Jeff Palacios, University of Chicago.

Lance Grande

Course: Systematic Ichthyology, University of Illinois at Chicago.

Graduate Students Advised: Christopher Fielitz, University of Illinois at Chicago; Eric K. Findeis, University of Massachusetts; Krista Lee, University of Illinois at Chicago.

Intern: Maureen McGrath, University of Illinois at Chicago.

Scott Lidgard

Graduate Student Advised: Paul Markwick, University of Chicago.

Interns and Work/Study: Kathleen Horazy, Smith College; David Suhrbur, University of Illinois at Chicago; Mary Wisz, University of Illinois at Chicago.

Matthew H. Nitecki

Course: Biotic Crises, University of Chicago.

Olivier M. Rieppel

Course: Phylogenetics, Northwestern University.

DEPARTMENT OF ZOOLOGY

Rüdiger Bieler

Course: Principles of Biology, Elmhurst College.

Graduate Students Advised: Jay Schneider, University of Chicago; Peter Wagner, University of Chicago; Paula M. Mikkelsen, Florida Institute of Technology.

Barry Chernoff

Course: Systematic Biology, University of Chicago.

Graduate Students Advised: Kate Kelley, University of Chicago; Thomas Schulenberg, University of Chicago; Scott Stepan, University of Chicago; John Harshman, University of Chicago; Allison Able, University of Chicago; Bill Stevens; University of Chicago; Brian Dyer, University of Michigan; Holanda Merced, Universidad Central de Venezuela; Nadia Romierez, Universidad Cnetral de Venezuela.

Post-Doctoral Associates: Paulo Buckup.

Interns & Work/Study: William Brown, Josheeyan Burks, Amy Hartwick, Jean Porterfield.

Robert F. Inger

Graduate Student Advised: Nancy Reagan, University of Chicago.

Lawrence R. Heaney

Course: Biogeography, University of Chicago; Terrestrial and Vertebrate Biology, Silliman University, Philippines

Graduate Students Advised: Danny Balente, University of Illinois at Chicago; Shukor Mdnor, University of Illinois at Chicago; Joe Walsh, University of Chicago.

Interns & Work/Study: Joselito Baril, University of the Philippines at Los Banos; Carlo Custudio, Protected Areas and Wildlife Bureau of the Philippines; Myrissa Lepiten, Silliman University, Philippines; Marlynn Mendoza, Protected Areas and Wildlife Bureau of the Philippines.

Scott M. Lanyon

Course: The Diversity of Life Through Time, University of Chicago.

Graduate Students Advised: Hector Colon, University of Chicago; John Harshman, University of Chicago; Thomas Schulenberg, University of Chicago; Kevin Dixon, University of Chicago; Jack Dumbacher, University of Chicago; Krista Lee, University of Chicago; Shaibal Mitra, University of Chicago; Robert A. Morgan, University of Chicago; Jonathan Regosin, University of Chicago; Joe Walsh, University of Chicago; Kevina Vulinec, University of Chicago; Robb Brumfield, Illinois State University.

Alfred F. Newton

Interns & Work/Study: Patricia Gibbons, University of Chicago; Michelle Jones, Albion College; Jose Luis Navarette, UNAM, Mexico.

Bruce D. Patterson

Courses: Mammalian Radiations, University of Illinois at Chicago; Independent Research, University of Chicago (for Scott Steppan).

Graduate Students Advised: Virginia Turner-Erfort, University of Illinois at Chicago; Diane M. Jedlicka, University of Illinois at Chicago; Pamela Austin, University of Illinois at Chicago; Scott Steppan, University of Chicago; Gregory Mikkelsen, University of Chicago; Janis Kohler, University of Chicago; John Yunger, Northern Illinois University; Chris Yahnke, Northern Illinois University.

A. Town Peterson

Graduate Students Advised: Dean Williams, UNAM, Mexico City; Laura Villasenor-Gomez, UNAM, Mexico City; Adolfo Navarro-Siguenza, UNAM, Mexico City; America Castaneda, UNAM, Mexico City; Hesiquio Benitez-Diaz, UNAM, Mexico City; Griselda Escalona-Segura, UNAM, Mexico City; Rocio Villalon, UNAM, Mexico City; Marivel Castillo, UNAM, Mexico City; Noe Vargas-Barajas, UNAM, Mexico City; Alonso Natividad-Santos, Universidad Michoacana.

Interns: Daniel Kluza, University of Chicago; Marivel Castillo, UNAM, Mexico City; Noe Vargas Barajas, UNAM, Mexico City.

Janet R. Voight

Interns: Shillock Yuan, University of Chicago.

Harold K. Voris

Graduate Student Advised: Thomas Sharp, Northeastern Illinois University.

Interns: Linsey Phillips, St. Ignatius H. S.; Florence Pontaoe, Whitney Young H.S.

Mark W. Westneat

Course: Coordinator for Introduction to Research at Field Museum, University of Chicago.

Graduate Students Advised: John Finnerty, University of Chicago.

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

UNDERGRADUATE INTERNS, 1992

National Science Foundation Interns

Department of Botany

Manette Bartolata, Prasant Nukalapati

Department of Geology

Maureen McGrath, Kathleen Horazy, Jeff Palacios

Department of Zoology

Jodi Sedlock, Alexandra Gnoske (Birds), Josheeyan Burks, Amy Hartwick (Fishes), Elizabeth Klarich, Patricia Gibbons (Insects), Alafijia Thurmond, Julie Stumpf, Jason Black, Roger Spencer, La Tisha Marcus, Yolanda Goodloe, Sarah Dunn (Mammals)

Illinois Board of Higher Education/University of Chicago Interns

Department of Anthropology (CCUC)

Ian Gordon

Department of Botany

Meilee Chen

Department of Geology

Johanna Lombard

Department of Zoology

Malcolm Henderson (Fishes), Shillock Yuan (Invertebrates)

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

VOLUNTEERS, 1992

Department of Botany

Helen Beiser, Phyllis Boyd, Elizabeth Farwell, Sharon Fung, Sharon Kramer, Lillie Mannings, Margaret Martling, Selwyn Mather, Sam Mayo, Gary Merrill, Albert Miller, Naomi Pruchnik, Martha Singer, Dan Snydacker, Michael Wenzel

Department of Geology

Colin Aigler, Barbara Ballard, Carol Braun, Irene Broede, David Ciske, Mary Sue Coates, Wendy Colter, Michael Henderson, John McConnell, Donald Newton

Department of Zoology

Thomas Anton, Paul Baker, Michael Blanford, Robert Brunner, Sophie Ann Brunner, Paul Bryan, Renee Buecker, Beth Burke, Sidney Camras, Robert Cary, Chris Calandra, Lisa Clarizio, Douglas Cogan, Arlene Cook, Randall DeBouvre, Roarke Donnelly, Stanley Dvorak, Betsy Ebert, M. Alison Ebert, Joel Froehling, Steve Geick, Alexandra Gnoske, Heather Greenman, Henry Greenwald, Amy Hartwick, Mary Hennen, Rachid Idriss, Diane Iko, George Kalins, Dorothy Karall, William Kephart, Kathy Kozol-Telfer, Theresa Krug, Scott Kuipers, Armand Littman, Margaret Matuszewski, GoPaul Noojibail, Molly Ozaki, Carolyn Perusisch, Yelena Petrosyan, Flo Pantaoe, Linsay Phillips, Tony Richter, Jim Rataczak, Tony Rattin, Sheila Reynolds, Jodi Sedlock, Thomas Simon, Jack Sloan, Jennifer Swanson, David Suhrbar, Minh-Tho Solomon, Julie Stumpf, Christine Taylor, Paul Thomas, Virginia Turner-Erfort, Marcia Vehlo, Bill Ujvari, David Ward, David Walker, Maxine Walter, Katherine Wiegmann, Jennifer Wheeler, Laura Zaidenberg

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

ASSOCIATES, FIELD ASSOCIATES, RESEARCH ASSOCIATES, 1992

Department of Botany

Associate

Betty Strack, M.S., Mycology

Field Associates

Sandra Knapp, Ph.D., Vascular Plants

David P. Lewis, M.S., Chemistry

Marko Lewis, Bryology

Antonio Molina R., Ing. Agr., Vascular Plants

Research Associates

Janis B. Alcorn, Ph.D., Ethnobotany

Robert F. Betz, Ph.D., Vascular Plants

William T. Crowe, Ph.D., Archeobotany

Sylvia Feuer-Forster, Ph.D., Palynology

Robin B. Foster, Ph.D., Vascular Plants

Jesus Garcia J., Biol., Mycology

Nancy Garwood, Ph.D., Vascular Plants

Sidney F. Glassman, Ph.D., Vascular Plants

Luis D. Gomez, Ph.D., Vascular Plants

Michael Huft, Ph.D., Vascular Plants

Timothy J. Killeen, Ph.D., Vascular Plants

Blanca Leon, Pteridology

Rogers McVaugh, Ph.D., Vascular Plants

Cirilo Nelson, Ph.D., Vascular Plants

Lorin I. Nevling, Jr., Ph.D., Vascular Plants

Richard W. Pohl, Ph.D., Vascular Plants

Patricio P. Ponce de Leon, Ph.D., Mycology

Abundio Sagastegui, Ph.D., Vascular Plants,

Isidoro Sanchez V., Ph.D., Vascular Plants

Pablo E. Sanchez V., M.Sc., Vascular Plants

Rudolf M. Schuster, Ph.D., Bryology

Rolf Singer, Ph.D., Mycology

D. Doel Soejarto, Ph.D., Vascular Plants

Tod F. Stuessy, Ph.D., Vascular Plants

Kenneth Young, Ph.D., Vascular Plants

Department of Geology

Associates

Doris Nitecki, M.A., Paleontology

Field Associates

Thomas Guensburg, Ph.D., Fossil Vertebrates

Research Associates

Edgar Allin, Ph.D., Fossil Vertebrates

David Bardack, Ph.D., Fossil Vertebrates

William Bemis, Ph.D., Lungfishes, Other "lower" Vertebrates,

Frank Carpenter, Sc.D., Fossil Invertebrates

Robert Clayton, Ph.D., Geochemistry

Albert Dahlberg, Ph.D., Fossil Vertebrates

Andrew Davis, Ph.D., Geochemistry

Robert DeMar, Ph.D., Fossil Vertebrates

Daniel Fisher, Ph.D., Fossil Invertebrates

Catherine Forster, Ph.D., Fossil Vertebrates

Gary Galbreath, Ph.D., Fossil Vertebrates

Lawrence Grossman, Ph.D., Meteoritics

James Hopson, Ph.D., Fossil Vertebrates

David Jablonski, Ph.D., Fossil Invertebrates

Michael LaBarbera, Ph.D., Fossil Invertebrates

Ricardo Levi-Setti, Ph.D., Fossil Invertebrates

Ernest Lundelius, Ph.D., Fossil Vertebrates

Frank McKinney, Ph.D., Fossil Invertebrates

Everette Olson, Ph.D., Fossil Invertebrates

J. Michael Parrish, Ph.D., Fossil Reptiles

David Raup, Ph.D., Fossil Invertebrates

J. John Sepkoski, Ph.D., Fossil Invertebrates

Paul Sereno, Ph.D., Fossil Reptiles

Paul Sipiera, Ph.D., Meteoritics

Joseph V. Smith, Ph.D., Minerology

Leigh Van Valen, Ph.D., Fossil Vertebrates

Department of Zoology

Associates

Barbara Brown, B.A., Primates

Sophie Ann Brunner, Preparation of Skeletons

Edward C. Dickingson, Philippine Birds

Ingrid Fauci, Maintenance of K.P. Schmidt Library, Translations

Elizabeth-Louise Girardu, Ph.D., Land Snails

Dorothy Karall, B.A., Illustration

Paula M. Mikkelsen, Marine Mollusks

Anthony Milewski, B.S, Large Mammal Comparative Ecology

Harry G. Nelson, M.Sc., Systematics of Dryopoid Coleoptera

Raymond Pawley, B.S., Herpetology

John A. Wagner, Ph.D., Insects

Field Associates

Fred Aslin, Land Snails, Geology, Biology

Jan Aslin, Land Snails, Geology, Biology

Barbara Becker, M.A., Zoology Research, Mammal Expeditions

Susan Davis, M.S., Neotropical Birds

John Douglass, M.S., Naturalist; Expeditions

Kiew Bong Heang, Ph.D., Sea Snakes

Ghazally Ismail, Ph.D., Sponsors Research Project in Malaysia for FMNH

Robert Izor, B.S., Carnivores of South America

Daryl R. Karns, Ph.D., Herpetology and Community Ecology

Douglas Kelt, B.S., Chilean Mammals

Vince Kessner, Land Snails

Scott Morrow Lindbergh, Mammals

David Matusik, Lepidoptera Taxonomy

Edward Moll, Ph.D., Biology of Fresh Water Turtles

John Murphy, M.S., Herpetology

Laurie Price, Land Snails

Walter Suter, Ph.D., Systematics of Scymaenidae (Coleptera)

Robert Wolff, Ph.D., Systematics of the Araneida

Research Associates

Peter L. Ames, Ph.D., Syringeal Morphology of Passerine Birds

Warren Atyeo, Ph.D., Systematics of Acri

William J. Beecher, Ph.D., Jaw & Limb Adaptations among Passerine Birds

Angelo Capparella, Ph.D., Neotropical Birds

Donald S. Chandler, Ph.D., Systematics of Psellaphidae (Coleoptera)

Dale Clayton, Ph.D., Host/Parasite Coevolution

David R. Cook, Ph.D., Systematics of Acari

Joel Cracraft, Ph.D., Avian Systematics and Evolutionary Biology

Sharon Emerson, Ph.D., Functional Anatomy of Anura

John Fitzpatrick, Ph.D., Birds

Jack Fooden, Ph.D., Asian Primates

Daniel Gebo, Primates

Bruce C. Jayne, Ph.D., Marine and Estuarian Snakes

Linda K. Kinkel, Ph.D., Ring-billed Gulls

David H. Kistner, Ph.D., Zoology

R. Eric Lombard, Ph.D., Functional Anatomy of Reptiles

Peter E. Lowther, Ph.D., Field Museum Nest and Egg Collection

Antonio Machado-Allison, Ph.D., South American Fishes

Patricia McGill-Harelstad, Ph.D., Behavior and Ecology of Herring Gulls

Peter Meserve, Ph.D., Population Ecology of Small Mammals

Debra K. Moskovits, Ph.D., Rainforest Tortoises

W. Wayne Moss, Ph.D., Systematics and Phylogeny of Bird Skin Parasites

Charles Nadler, M.D., Sciuridae

Roy A. Norton, Ph.D., Systematics of Acari

Charles Oxnard, Ph.D., Vertebrate Anatomy

Victor Pacheco, Peruvian Mammals

Philip D. Perkins, Ph.D., Aquatic Coleoptera

Ronald Pine, Ph.D., Taxonomy of South American Mammals

Stephen Pruett-Jones, Ph.D., Behavior and Ecology of Birds of Paradise

George B. Rabb, Ph.D., Taxonomy of Salamanders, Phylogeny of Snakes

Charles Reed, Ph.D., Morphology and Evolution of Mammals

Eric Allen Rickard, Ph.D., Biogeography of Mammals in Southeast Asia

Scott K. Robinson, Ph.D., Evolutionary Ecology within the Icterinae

Jennifer M. Shopland, Ph.D., Birds, Ecology of Mixed Species Bird-flocks in Neotropics

Petra Sierwald, Ph.D., Systematics, Morphology and Evolution of Spiders (Arachnida: Araneae)

Ronald Singer, D.Sc., Mammalian Anatomy

Robert Stuebing, M.S., Malaysian Ecology

Margaret K. Thayer, Ph.D., Systematics of Staphylinidae (Coleoptera)

Jamie Thomerson, Ph.D., Central and South American Fishes

Robert Timm, Ph.D., Host Parasite Relationship in Mammals

Robert Traub, Ph.D., Siphonoptera

Richard Wassersug, Ph.D., Tadpole Research

John Wible, Ph.D., Higher Level Taxonomy of Mammals

Glen E. Wollfenden, Ph.D., Florida Scrub Jay

Guanfu Wu, Chinese Fauna, Systematics

Chang Man Yang, B.S., Decapods

Ermi Zhao, Ph.D., Chinese Fauna, Systematics

FIELD MUSEUM OF NATURAL HISTORY

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

Collection Statistics - 1992 - Collection Size

Department of Botany

Collection	Number of Specimens
Algae	78,171
Fungi	87,719
Lichens	52,169
Bryophytes	168,119
Ferns	98,296
Seed Plants	2,065,933
Subtotal	**2,550,407**

Department of Geology

Collection	Number of Specimens
Physical Geology	62,929
Invertebrate and Plant Paleontology	398,727
Vertebrate Paleontology	134,606
Subtotal	**596,262**

Department of Zoology

Collection	Number of Specimens
Amphibians and Reptiles	250,610
Birds	394,000
Fishes	1,769,991
Insects	9,886,646
Invertebrates	3,835,500
Mammals	146,589
Subtotal	**16,283,336**
TOTAL SPECIMENS	**19,430,005**

FIELD MUSEUM OF NATURAL HISTORY

CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY

Collection Statistics - 1992 - Collection Growth

	Botany	Geology	Zoology	Total
1981	2,230,634	509,701	12,011,366	19,430,005
1992	2,550,407	596,262	16,283,336	15,346,951

Collection Statistics - 1992 - Use of Collections by Loan

Department	Number of Loans	Specimens Loaned	Specimens Borrowed
Botany	202	14,765	2,628
Geology			
Vert. Paleo.	63	377	0
Physical	22	61	0
Invert. & Plant	20	170	0
Total	105	608	0
Zoology	340	44,613	4,992

Collection Statistics - 1992 - Scholarly Use of Collections by Visitors

Department	Number of Professionals	Number of Students	Number of Others
Botany	78	37	12
Geology			
Vert. Paleo.	26	38	9
Physical	14	0	0
Invert. & Plant	39	7	9
Total	79	45	18
Zoology	224	170	274

MUSEUM AFFAIRS

ANNUAL REPORT

Field Museum of Natural History

1992

FIELD MUSEUM OF NATURAL HISTORY

MUSEUM AFFAIRS

Report to the Board of Trustees
1992

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MUSEUM AFFAIRS

Jonathan Haas, Ph.D.
Vice President
Director, Center for Cultural Understanding and Change

Jacqueline Carter
Assistant to the President for Cultural Understanding

Darlene Pederson
Secretary to the Vice President

Department of Anthropology

Bennet Bronson, Ph.D. ..... Curator and Chairman
Donald Collier, Ph.D. ..... Curator Emeritus
Glen Cole, Ph.D. ..... Retired Curator and Consultant
Jonathan Haas, Ph.D. ..... Curator
Phillip Lewis, Ph.D. ..... Curator
Anna Roosevelt, Ph.D. ..... Curator
Charles Stanish, Ph.D. ..... Associate Curator
John Terrell, Ph.D. ..... Curator
James W. Van Stone, Ph.D. ..... Curator
Winifred Creamer, Ph.D. ..... Visiting Assistant Curator
Maxwell Owusu, Ph.D. ..... Visiting Curator
Robert Welsch, Ph.D. ..... Visiting Associate Curator
Sheryl Heidenreich, B.S. ..... Administrative Assistant
Mark Alvey, M.A. ..... Collections Management Assistant
Mavis Blacker ..... Collections Management Assistant
James Foerster, B.A. ..... Department Secretary
William G. Grewe-Mullins, B.A. ..... Assistant Collections Manager
Christine Gross, B.A. ..... Collections Manager
Lanet Jarrett, M.S. ..... Collections Management Assistant
Janice Klein, M.A. ..... Registrar
Karen Poulson, B.A. ..... Lab Technician
Loran Schell Recchia ..... Technical Assistant

Rosa Salazar.....Collections Management Assistant

Division of Conservation

Catherine Sease, B.Sc.....Head, Division of Conservation
Catherine Anderson, M.S.....Assistant Conservator
Ruth Andris.....Restorer
Christine Del Re, B.Sc.....Associate Conservator
Wendy Morton, M.A.C.....Assistant Conservator
David Rasch, M.S.....Assistant Conservator
Susana Zubiate, M.S.....Advanced Intern

CENTER FOR CULTURAL UNDERSTANDING AND CHANGE
MISSION STATEMENT

Since its inception in the 1893 World's Columbian Exposition, the Field Museum has had a mission to promote understanding and respect for similarities and differences among the peoples of the world. To help coordinate and focus our efforts to promote broad-based understanding of cultural diversity across society as we enter our second century, the Museum has established a Center for Cultural Understanding and Change. At the heart of the Center for Cultural Understanding and Change stands the discipline of anthropology. Through the research and collections of anthropology the Museum is able to to increase knowledge of and appreciation for cultural differences and similarities, and to find explanations for how and why cultures change in response to social, environmental, economic, religious or philosophical influences.

Within the Museum, the goal of the Center is to promote cultural understanding both internally within our own diverse workforce, and externally from the neighborhoods of Chicago to the many different cultures of the global community. The "culture" in the Center for Cultural Understanding and Change is an embracing concept meant to include the full range of human thought and behavior inherent in a large and complex world. Under this label will fall groupings of people based on myriad factors that have been used in many societies to separate one group from another, including such things as age, religion, gender, language, disabilities, skin color, and ethnic background.

Cultural understanding is about gaining new insights into how and why people behave and think the way they do. It is about the full range of human accomplishment, behavior, and thought; for example, how people make friends and why people go to war, what is the role of religion in diverse societies and the economics of farming in different environments, how do different culture raise their children and care for the aged? It is about building respect for human cultures in all their dimensions and manifestations. It is the goal of the Center for Cultural Understanding and Change to strengthen the role of the Museum as a forum for both research and public learning about the similarities and differences of the many cultures of our own society and the world. The Museum is a place for scholars, the general public, and school children to learn about how cultures have come to be different across the face of the globe. It is a center for learning, learning how to better understand and respect the history, customs, and beliefs we of our neighbors from Chicago out to the farthest reaches of the international community.

The objectives of the Center for Cultural Understanding and Change intersect with several different divisions within the Field Museum and relate to areas both within the institution and outside among our many public audiences. There are three primary areas of intersection for the Center:

- Research and Collections
- Public Learning
- Diversity in the Workforce

In each of these areas there are existing programs that address the Museum's mission to promote cultural understanding within society. The role of the Center in each area will be to encourage, focus, and further develop specific programs and activities that are directly in line with the Museum's mission. The Center can provide direct assistance in terms of coordinating the involvement of different cultural groups in Museum activities, forming advisory groups, grant writing, coordinating training programs, organizing seminars or lectures. Every effort will be made to coordinate the efforts of the Center with already existing programs in each of the areas of intersection so as not to duplicate efforts and cover old ground. There will also be direct coordination of the efforts of the Center and the activities of the three new advisory councils: Research Advisory Council; Collections Advisory Council; and Public Learning Advisory Council.

RESEARCH AND COLLECTIONS

Anthropology is the foundation of the Center for Cultural Understanding and Change. It is through anthropology that the Museum and the Center can communicate insights into the similarities, differences and interdependencies in the different cultures of modern society. In the areas of research and collections, there will be a number of ways in which the Center can productively intersect with the Anthropology Department.

- Translation. The immediate goal of the Anthropology program is to conduct collections-based research related to the explanation of

patterns of human behavior and thought over time. To complement this research agenda, the goal of the center will be to find ways to "translate" the findings of anthropology into language and other media of communication that are meaningful to the large and diverse audiences of the Museum. This can be done through:

a. the kind of temporary exhibits outlined above;

b. public relations (PR) campaigns aimed at giving our research and collections a wider public profile;

c. public lecture series highlighting both our own curators anthropologists drawn from around the country and world talking about the significance of anthropological research;

d. and possibly more popularly-oriented publications that might become part of a series similar to the current Centennial publication series.

e. looking specifically at the humanistic and scientific significance and importance of the anthropological work being conducted by our current curators in Anthropology.

- Indigeneous Participation. Since its inception, the Museum has been a forum for representing the cultural diversity of the world in the context of exhibits. Yet there are few avenues available for the indigeneous people represented in the Museum to participate in the Museum community, either as staff members, researchers, artisans or museum professionals. The Center can help facilitate the participation of people for different culture groups in a number of different ways:

a. develop internships for native people to come to the Museum as artists, apprentices, researchers;

b. develop an advisory councils to give outside perspectives on the activities of our Collections and Research divisions and public programming.

c. We also specifically need an advisory council of Native Americans to provide guidance in our on-going repatriation activities;

d. coordinate contacts with and visits by Native groups visiting the Museum to consult, review exhibits and collections, or repatriate ancestral remains and ob1jects.

PUBLIC LEARNING

The Center for Cultural Understanding and Change can make a contribution in two main areas, exhibits and educational programming. Intersecting with these two areas, the Center can maximize Public Program's efforts to communicate the Museum's focus on the richness in human diversity as well as advance the Museum's goal to promote understanding and respect for human diversity. There are several areas where the Center can provide support and focus.

- Exhibits. There are two different aspects of the exhibits program that relate to the Center: Developing new exhibits that explicitly address the Museum's commitment to the goals of cultural understanding, and revising existing exhibits to better reflect that same commitment.

  a. For new exhibits, it is a specific goal of the Center to work with the Exhibits program to develop a new exhibit on "Living Together in the City of Chicago". This exhibit will be a celebration of the rich cultural diversity in Chicago, and directly

recognize the Museum's dedication to the people of the city.

b. For existing exhibits, the Center can work with the "Fix-up Program" in Program Development to explore cost-effective (i.e. cheap) means to update exhibits that may be out-of-date, not reflective of changes in our society's perspectives, or otherwise not sensitive to changing conditions of the people represented in the Museum. The Museum has a newly-defined mission tightly focused on understanding cultural diversity and change, and all of our exhibits, old and new should reflect that new mission in whatever ways possible. This can be accomplished in simple ways, such as removing inappropriate labels in older exhibits. More comprehensively, it might also be possible to develop "guides" to existing exhibits that specifically highlight cultural understanding and the reduction of bias.

c. The Center will also serve as a forum for exploring the possibility of a future temporary exhibit program to target greater understanding of different cultural groups involved in local, national, and global events. Anthropology can give a unique perspective to the group dynamics of such things as the civil war in Yugoslavia, the gangs of Chicago, and the Jewish/Black tensions in New York. All of these, with a firm grounding in anthropology, are unique opportunities, within the context of the Field Museumm to inform how cultures respond to social, environmental, economic, religious or philosophical influences.

- Outreach and Public Programming. The outreach and programming efforts of the Education division are probably the areas where the mission of cultural understanding is already being carried out most explictly. The existing programs in

these areas are very successful carrying the Museum's mission out to broad and diverse audiences and serving many of the needs of the educational community. The goal of the Center will be to support these strong current efforts by helping to find ways to expand and focus the existing programming efforts in the areas of teaching about cultural diversity and outreach into Chicago's different ethnic communities.

a. Many educators in the Chicago area turn to Field Museum when in need of information on how to teach about the different cultures of the world. Although it is not possible to have all the resources teachers may need, we can be a resource on where to look for applicable resources (other museums, libraries, bookstores, video resources, etc.). As a pilot project in this area, in 1993 the Center will develop a guide to appropriate kinds of materials available for teaching about the Indians of North America.

b. Outreach programming has been successful in recruiting individuals from historically underrepresented communities as visitors, members and volunteers. In connection with an exhibit about living together in Chicago, the Center will build on outreach programs to further increase relationship in the ethnic communities of the Chicago area. The goal of such outreach will be to generate greater support and the sense of "connection" to the Field Museum in communities that are historically underrepresented among our members and visitors.

DIVERSITY IN THE WORKFORCE

By the nature of its cross-cultural mission and collections the Field Museum has an inherent mandate to eliminate all forms of discrimination in the work force and to insure that the work force reflects the diversity of our own culture. For the Center, the primary area of intersection here will be with the Personnel Department. Personnel is actively pursuing affirmative action and insuring equitable and respectful treatment of all employees in the Museum. The Center has a place in working with Personnel to promote programs that will attract, develop, and manage cultural diversity in the Museum's workforce. Areas of possible intersection include:

- Managing diversity - explore a management training program which offers managers the necessary skills to utilize the full potential of all employees. Through a targeted curriculum of managing diversity, managers should be able to:

  a. understand and integrate cultural differences in the workplace;

  b. effectively communicated Museum goals, strategies and performance expectations to all employees;

  c. conduct productive, honest and helpful performance appraisals on a year-round basis;

  d. pursue with employees opportunities to grow and develop in their careers with the Museum;

  e. account for their progress in promoting mutual respect and understanding.

- Mentoring - help establish an in-house mentoring program.

  We must recognize that there are groups that have historically not participated fully in all managerial levels and in certain program areas in the Museum. A number of studies in several fields have shown that mentoring is a key to success and advancement. In this context, mentoring can play a key role in achieving Museum goals to include and promote cultural diversity in all aspects of the Museum's operation. A mentoring program can include:

  a. guidelines for managers on how to mentor employees

  b. guidelines for employees on how to seek and take advantage of mentoring opportunities - mentoring is a two-way street.

  c. incorporating mentoring criteria in the annual evaluation of managers.

  d. targeting specific individuals for mentoring to accomplish immediate goals of managing diversity in the present staff.

- Internships. As another means to gain broader

  representation of diverse cultural groups in all parts of the Museum, internships can be established to allow people from cultural groups underrepresented in some part of the Museum to get initial experience in other areas which might provide new avenues for advancement and career development.

  a. Internal internships might be established for existing employees to move to other areas in the Museum and expand their career possibilities. Housekeeping or Security staff, for example, might be given internships to work in one of the research laboratories or in the Education division.

b. General internships might also be established for students from underrepresented groups to gain exposure to the museum environment and get some first-hand experience in career fields they might not otherwise consider. Our existing programs for Black, Hispanic and Native American students are examples of such internships, and should be expanded.

The Center for Cultural Understanding and Change helps provide a focus for the Field Museum as we seek to carry out our mission to learn and educate about the many diverse peoples of the world. It serves as a means to bring together all the different divisions within the institutions to insure that we are all pulling together in the direction of promoting respect and understanding of the similarities and differences in the cultures around us.

ANTHROPOLOGY

BENNET BRONSON (Ph.D. 1976, Pennsylvania) Chairman and Curator, Asian Archaeology and Ethnology. Joined Field Museum in 1971.

RESEARCH PROGRAM:

My chief research interests are in the areas of trade and technology before modern times and in the links between these and larger patterns of social and economic change. The premodern world had surprising similarities to our own in terms of the importance of economic competition between social or political units, the effects of technological progress, and the causes of economic development and decline. In line with these interests I have been involved for a number of years in a program of archaeological work in Asia combined with research on the Asian collections of this museum. I and my colleague, Research Associate Dr. Chuimei Ho, are currently finishing the analysis and writing up of the excavations jointly conducted by the Field Museum and the Royal Thai Fine Arts Department at two early seaports, Ko Kho Khao and Laem Pho, in southern Thailand. Both sites yield large quantities of trade goods, mostly ceramics, from China and the Middle East. Our next step will be to learn more about the sources of those trade goods. I spent a month in southeastern China last summer examining local museum collections and discussing possible future field research there. These plans will be facilitated by the excellent connections that Dr. Ho has been building up for this museum with Chinese research institutions at the local, provincial and national levels.

Along with fulfilling administrative and museological responsibilities within the museum, I have continued work on several smaller collections-oriented projects. These include studies of East and Southeast Asian animal pastimes, of Chinese bronzes dating to the Ming and Qing periods (ca. AD 1400-1900), of the chemistry of early Asian glass, of Indonesian and Philippine ethnographic textiles, and of the elite decorative arts of China and Japan.

RECENT PUBLICATIONS:

1986 (with P. Charoenwongsa) *Eyewitness Accounts of the Early Mining and Smelting of Metals in Mainland South East Asia.* 36 pp. Thailand Academic Publishing Co., Bangkok.

1987 Terrestrial and Meteoritic Iron in the Indonesian Kris. *Journal of Historical Metallurgy 22*, 1:8-15.

1988 The Role of Barbarians in the Fall of States. in N. Yoffee and G. Cowgill eds., *The Decline of Civilizations*, pp 196-218. U. of Arizona Press, Tucson.

1988 (with P. Charoenwongsa, eds.) *The Stone and Metal Ages of Thailand.* Monographs in Thai Antiquity, Vol. 1. Thai Archaeology Working Group, Bangkok. 135 pp.

1990 (with W. Rostoker) *Pre-Industrial Iron: Its Technology and Ethnology.* 234 pp. Archeomaterials Press, Philadelphia.

1991 ["1990"] Export Porcelain in Economic Perspective: The Asian Ceramic Trade in the 17th Century. In C. M. Ho, ed., *Ancient Ceramic Kiln Technology in Asia*, pp 126-151. Centre of Asian Studies, University of Hong Kong.

WINIFRED CREAMER (Ph.D. 1983, Tulane) Visiting Assistant Curator, Northern Rio Grande Research Project. Joined Field Museum in 1989.

RESEARCH PROGRAM:

Dr. Creamer conducted excavations at the Protohistoric (A.D. 1450-1680) site of Pueblo Blanco, south of Santa Fe, NM, during July and August. Work included excavation of 11 rooms at the site, and an extensive series of surface collections. This research continues the Northern Rio Grande Research Project investigation of the occupation and abandonment of settlements in northern New Mexico before and during the period of earliest European contact. Presentations reviewing models of regional demography compared with research results to date were made at professional meetings during the year.

The 1992 field work included a field school from Northern Illinois University. Eleven students from all parts of the country participated in the excavations and laboratory processing of artifacts. This experience is an essential part of students research training in archaeology, an important element in developing the next generation of scholars.

RECENT PUBLICATIONS:

1983 Archaeological Faunal Remains as indicators of territory size and subsistence strategy. *Brenesia* 21:395-402. San Jose, Costa Rica: National Museum of Costa Rica.

1984 Costa Rican trade in context. In *Interregional Contacts in Costa Rican Prehistory*, edited by Winifred Creamer and Esther Skirboll. London: British Archaeological Reports 226:179-186.

1984 *Interregional Contacts in Costa Rican Prehistory* (edited with Esther Skirboll). London: British Archaeological Reports 226.

1985 Tribe and Chiefdom in Lower Central America (with Jonathan Haas). *American Antiquity* 50(4):738-754.

1987 Mesoamerica as a Concept: An Archaeological View from Central America. *Latin American Research Review* 22(1):35-62.

n.d.a. Demography and the Proto-Historic Pueblos of the Northern Rio Grande: A.D. 1450-1680. In, Late Prehistoric and Early Historic New Mexico, edited by Bradley Vierra. Albuquerque: New Mexico Archaeological Council, in press.

JONATHAN HAAS (PhD. 1979, Columbia University) Curator, New World Archaeology. Joined Field Museum in 1989

RESEARCH PROGRAM:

In addition to my responsibilities as Vice President for Museum Affairs and Director of the new Center for Cultural Understanding and Change, I continue with my current research in the archaeology of the Southwestern United States. In the summer of 1992, I worked with my co-Principle Investigator, Winifred Creamer, on excavations at the site of Pueblo Blanco, just south of Santa Fe, NM. These excavations were one part of a broad research program to examine the effects of European contact and colonialism on the Pueblo peoples of northern New Mexico in the 15th and 16th centuries A.D. On this project we are looking at the "Protohistoric" time period which extends from approximately A.D. 1450, before the arrival of western Europeans in the Americas, to A.D. 1680 which is the time of the Pueblo Revolt, when the Spanish missionaries and colonists were expelled from the Southwest. The initial focus of the project is on possible changes in the size and distribution of the population in the region during the period from 1450-1680. By examining changing population figures for this period we hope to gain insights into the possible effects of Spanish diseases and regional warfare on the Pueblo peoples. Back in the laboratory, we continued with our long-running analysis of ceramic collections taken from a sample of 13 of the 65 known protohistoric sites in the northern New Mexico area. Ultimately, we hope that this analysis can be used as a means for developing a master seriational chart for all the major ceramic types in the region. This seriational chart can then be used to assess the dates of occupation and abandonment of archaeological sites based on surface ceramics.

In addition to the field research and laboratory work, I am actively involved with the issue of the repatriation of human remains and culturally important artifacts. I was appointed this past year by the Secretary of the Interior to serve on the Review Committee for the Native American Graves Protection and Repatriation Act and through the Committee have been working on developing regulations for implementing the Act. I have also been working with a team of people in the Field Museum to develop our own procedures for complying with repatriation requests and responding to the requirements of the federal legislation.

RECENT PUBLICATIONS:

1985b "Excavations on Huaca Grande: An Initial View of the Elite of Pampa Grande on the North Coast of Peru." *Journal of Field Archaeology*, Vol. 12:391-409.

1987a *The Origin and Development of the Andean State.* Co-editor with Shelia Pozorski and Thomas Pozorski. Cambridge University Press.

1989 "The Evolution of the Kayenta Regional System." In *The Sociopolitical Structure of Prehistoric Southwestern Societies*, edited by Steadman Upham and Kent Lightfoot. Westview Press.

1990a *The Anthropology of War*, ed. Cambridge University Press.

1990 "Warfare and Tribalization in the Prehistoric Southwest." In *The Athropology of War*, edited by Jonathan Haas. Cambridge University Press.

1991 "The Challenge of Repatriation." *Museum News* Jan/Feb

1992 "The Native American Graves Protection and Repatriation Act: Prospects for New Partnerships between Museums and Native American Groups," with Thomas Boyd, *Arizona State Law Journal*, March.

PHILLIP LEWIS (Ph.D. 1966, University of Chicago) Curator, Primitive Art and Melanesian Ethnology. Joined Field Museum in 1952. Retired August 31, 1992.

RESEARCH PROGRAM:

Dr. Lewis continued his researches into the systems of art and society in New Ireland. Themes of continuity and change in the art continue to be the most fruitful research topics as New Irelanders themselves edge gingerly into the modern world. Although most of the extant collections from New Ireland tend to be traditional in form, it becomes more and more clear that the corpus of material cultural objects available for study are products of contemporary art systems. To study art in today's changing world, it will be very rare indeed to see "pure" traditional art, and we had better pay attention to the contemporary scene.

ANNA CURTENIUS ROOSEVELT (Ph.D. 1977, Columbia University) Curator of Archaeology. Joined Field Museum in 1991.

RESEARCH PROGRAM:

Dr. Roosevelt is involved in research on human ecological adaptation and cultural evolution in the tropical lowlands of South America. This year she directed the third of the four field seasons in her two part National Endowment for the Humanities and MacArthur Foundation funded project (1988-1990, 1991-1993), the Developmental Sequence at Santarem on the Lower Amazon, Brazil. With the collaboration of the Museu Paraense Emilio Goeldi Museum and the University of Illinois, the New York Botanical Garden, the 20-member research team surveyed and excavated Paleoindian deposits at Monte Alegre near Santarem, Para. This year's research discovered polychrome cave paintings, projectile points, and specimens of a possible new palm species in cave deposits dated to 11,500 years before present. Dr. Roosevelt continued participation in an international research project on the Human Dimensions of Environmental Change in Northern Venezuela. This inter-disciplinary project is based at the Center for Remote Sensing and the Experimental University Francisco de Miranda, Coroa, Venezuela and funded by the Venezuelan Academy of Sciences. The participants are writing up the results of last year's research trip and discussions. Roosevelt initiated a new research project on the Quaternary Geology and Archaeology of the Lower Amazon with geologists from the Universidade de Amazonas in Manaus.

RECENT PUBLICATIONS:

1987 The Evolution of Human Diets. In *Food and Evolution: Toward a Theory of Human Food Habits*, edited by M. Harris and E. Ross. Philadelphia: Temple University Press. Pp. 565-578.

1987 Chiefdoms in the Amazon and Orinoco. In *Chiefdoms in the Americas*, edited by D. Drennan and C. Uribe. Lanham, MD: University Press of America. Pp. 153-185.

1988 Microcomputers in the Lower Amazon Project. *Advances in Computer Archaeology* 4:41-53. (symposia organized, 1988).

1988 Interpreting Certain Female Images in Prehistoric Art. In *The Role of Gender in Precolumbian Art and Architecture*, edited by Virginia E. Miller. Lanham, MD: University Press of America. Pp. 1-34. (symposia participation, 1985).

1992. Secrets of the forest: An archaeologist reappraises the past -- and future -- of Amazonia. *The Sciences* November/December. Pp. 22-28. New York: New York Academy of Sciences.

CHARLES STANISH (Ph.D. 1985, University of Chicago) Associate Curator, Middle and South American Archaeology and Ethnology. Joined Field Museum in 1987.

RESEARCH PROGRAM:

For the last 12 years, I have been studying the ancient civilizations fo southern Peru and western Bolivia in the high southern Andes. My research began in a small valley in far southern Peru. My team and I discovered dozens of archaeological sites that dated from AD 900 to the Spanish Colonial Period. We specifically studied the ancient irrigation systems as they changed and collapsed over time. We learned that progressive drought and population increases ultimately caused the collapse of the agricultural system by the 15th century.

In 1987 I began a new project in the Titicaca Basin of southern Peru. The Titicaca region is what archaeologists refer to as a "nuclear center of civilization". Nuclear centers are heartlands of ancient society, with long and complex histories of cultural evolution. The first settled villages in the Titicaca Basin began around 2000 BC. By 200 BC, archaic states controlled vast areas of agricultural land and built impressive irrigation systems. We have studied these societies paying special attention to the rise and fall of ancient agricultural systems. In the last five years, we have discovered almost 400 new sites.

Over the past several years, I have published a number of scientific papers and a book on my research in the southern Andes. Our research continues in Peru supported by the National Science Foundation. We plan to return every year to continue our study of the ancient civilizations of the Titicaca Basin.

RECENT PUBLICATIONS:

1987 Agroengineering Dynamics of Post-Tiwanaku Settlements in the Otora Valley of Southern Peru. In *Prehistoric Agricultural Fields in the Central Andes* pp. 337-364. British Archaeological Reports, International Series. William Denevan, Kent Mathewson, and Gregory Knapp eds.

1989 Household Archaeology: Testing Models of Zonal Complementarity in the South Central Andes. *American Anthropologist* v. 91(1):7-24.

1989 *Ecology, Settlement and History in the Osmore Drainage.* Edited by Don Rice, C. Stanish and P. Scarr. British Archaeological Reports International Series. Oxford.

1990 (with Brian Bauer) Killke and Killke-related Pottery from Cuzco, Peru, in the Field Museum of Natural History. Chicago: *Fieldiana Anthropology.* New Series no. 15.

1991 A Late Prehispanic Ceramic Chronology for the Upper Moquegua Sierra, Peru. Chicago: *Fieldiana Anthropology.* New Series no. 16.

1992 *Ancient Andean Political Economy.* Austin: University of Texas Press.

1993 (with Edmundo de la Vega, and Kirk Lawrence Frye) Domestic Architecture of Lupaqa Area Sites. In: *Domestic Architecture in South Central Andean Prehistory.* Edited by Mark Aldenderfer. University of Iowa Press.

1993 (with Mark Aldenderfer) Domestic Architecture, Household, and the Past in the South-Central Andes. In: *Domestic Architecture in South Central Prehistory.* Edited by Mark Aldenderfer. University of Iowa Press.

JOHN TERRELL (Ph.D. 1976, Harvard) Curator, Oceanic Archaeology and Ethnology. Joined Field Museum in 1971.

RESEARCH PROGRAM:

The different projects that I am currently working on may seem so disparate that nobody would imagine they share anything in common. The thread tying them together, however, is a theme that has been guiding my anthropological research for nearly three decades: cultural diversity. The A. B. Lewis Project, a joint undertaking with Visiting Associate Curator Robert L. Welsch which now being funded both by the National Endowment for the Humanities and by the National Science Foundation, is using our famous Melanesian collections to determine patterns of cultural similarity and difference on the north coast of New Guinea. Our research is showing that anthropologists have frequently misread both the social stability and cultural diversity of societies in the Pacific. The Ruatepupuke II Project, a collaborative undertaking with the Maori people of Tokomaru Bay, New Zealand, now nearing completion, is restoring their ancestral meeting house at Field Museum as an outpost of Maori culture in the Americas: a place where people in Chicago, and visitors to our city, can learn about Maori values, traditions, arts, and aspirations. The Kinship & Adoption Project, a collaborative undertaking with Judith Modell of Carnegie Mellon University and Laura Litten of Columbia College, is strengthening anthropology's documentation of the diverse ways in which people around the world construct and evaluate human relationships. The Representations of History Project, a collaboration with Lin Poyer of the University of Cincinnati, is documenting the many ways in which people in the Pacific construct and make use of history in their lives. Finally, The Door In The Wall Series of children's books, which I initiated in 1991, is taking the Museum's educational message about cultural diversity out to the schools and homes of America.

RECENT PUBLICATIONS:

1986. *Prehistory in the Pacific Islands*, Cambridge University Press.

1988. History as a family tree, history as an entangled bank. *Antiquity* 62:642-57.

1990. Storytelling and prehistory. *Archaeological Method and Theory* (M. B. Schiffer, ed.), 2:1-29.

1991. Continuity and change in economic relations along the Aitape coast of Papua New Guinea, 1909-1990 (with R. L. Welsch). *Pacific Studies* 14:113-128.

1991. Disneyland and the future of museum anthropology. *American Anthropologist* 93:149-153.

1992. Language and Culture on the North Coast of New Guinea (with R. L. Welsch and J. N. Nadolski). *American Anthropologist* 94:568-600.

1993. Regional Studies in Anthropology: A Melanesian Prospectus. *Current Anthropology* (in press).

JAMES VANSTONE (Ph.D. 1954, University of Pennsylvania) Curator, North American Archaeology and Ethnology. Joined Field Museum in 1976.

RESEARCH PROGRAM:

A major research focus of mine for the past 25 years has been a study of the impact of Russian and early American contact on the traditional culture of the Yupik-speaking Eskimos of southwest Alaska. This project has involved ethnographic investigations in Eskimo villages on the Kuskokwim, Nushagak, and Yukon rivers, archaeological excavations of historic sites in these areas, and ethnohistorical research in libraries and archives relating to the period from 1800 to about 1920. A major effort has been made to understand the history of the fur trade, the impact of the Russian Orthodox Church as well as Protestant and Roman Catholic churches, and the involvement of Eskimos in the commercial fishing industry. Changes in the size and distribution of population in the region has been documented as well as social and technological changes. Much of this material has been published, including archaeological site reports, ethnohistories, and translated and edited historical documents. Current efforts include completion of a report on an historic archaeological site at the mouth of the Naknek River on the Alaska Peninsula.

A second research focus has been on traditional subsistence activities of Inupiat-speaking Eskimos in Kotzebue Sound, Alaska based on field work undertaken by myself and a colleague in the early 1950s. At that time there were many informants still alive who had first-hand knowledge of the traditional way of life. The purpose of this project has been to provide a base line for understanding some aspects of contemporary Inupiat life in the region. A current study is documenting traditional beluga hunting in Kotzebue Sound.

My third research interest has been contextual studies of material culture based on the museum's ethnographic collections. This work, which has continued for nearly 20 years, is mostly focused on the museum's Eskimo and northern Woodland and Plains material culture. It is hoped that these studies, in addition to placing important collections in their cultural context, will help to make the museum's North American ethnographic collections better known to the academic community and to Native Americans. Current work involves studies of Copper Inuit and Assiniboine collections.

RECENT PUBLICATIONS:

1983 (with H. N. Michael, eds.) *Cultures of the Bering Sea Region: Papers from an International Symposium*, International Research and Exchanges Board, New York.

1984 Mainland Southwest Alaska Eskimo. In: *Handbook of North American Indians*, vol. 5, Arctic, pp. 224-242.

1986 "And he was Beautiful": Contemporary Athapaskan Material Culture in the Collections of Field Museum of Natural History. *Fieldiana: Anthropology*, n.s., no. 11.

1988 (with D. Kraus) *Russian Exploration in Southwest Alaska: The Travel Journals of Petr Korsakovskiy (1818) and Ivan Ya. Vasilev (1929).* Rasmuson Library Historical Translation Series, vol. IV. University of Alaska Press.

1988 Hunters, Herders, Trappers, and Fishermen. Pp. 173-181 in *Crossroads of Continents: Cultures of Siberia and Alaska*, edited by W. W. Fitzhugh and A. Crowell. Smithsonian Institution Press. Washington, D.C.

1991 The Isaac Cowie Collection of Plains Cree Material Culture from Central Alberta. *Fieldiana: Anthropology*, n.s., no. 17.

1991 (with C. V. Lucier) Winter and Spring Fast Seal Hunting by Kangiġmiut and Other Iñupiat of Kotzebue, Alaska. *Etudes/Iniut/Studies*, vol. 15, no. 1, pp. 29-49. (published in 1992).

1992 Material Culture of the Blackfoot (Blood) Indians of Southern Alberta. *Fieldiana: Anthropology*, n.s, no. 19.

ROBERT WELSCH (Ph.D. 1982, University of Washington) Visiting Associate Curator, A.B. Lewis Research Project. Joined Field Museum in 1984.

RESEARCH PROGRAM:

Work continued on the A. B. Lewis Project, including preparations of 12 months of field research in the West Sepik Province of Papua New Guinea (beginning 1993) on a grant received from the National Endowment for the Humanities, and another from National Science Foundation. Photographs of some 3,500 specimens from the North Coast of New Guinea have been taken and duplicated for this field research. Copies are to be deposited at the National Museum in Papua New Guinea and at the Museum für Völkerkunde in Dresden. Plans are also underway for collaborative research with Dr. Frank Tiesler (Museum für Völkerkunde, Dresden) who will join Drs. Welsch and Terrell in the field. Important strides have been made to establish a North Coast Research Group to facilitate collaboration among the major scholars who conduct research on this part of Papua New Guinea. Dr. Welsch is completing a manuscript for publication at the University of Hawaii Press; this will be a richly illustrated edition of A. B. Lewis's field diaries during the Joseph N. Field South Pacific Expedition, 1909-1913. Together with Dr. Terrell and Mr. John Nadolski, Dr. Welsch was the 1992 winner of the Morton H. Fried Prize from the American Anthropological Association for the best article published in the American Anthropologist over the past year.

RECENT PUBLICATIONS:

1986 Primary Health Care and Local Self-Determination: Policy Implications form Rural Papua New Guinea. *Human Organization* 45(2):103-112.

1987 Multinational Development and Customary Land Tenure: The Ok Tedi Project of Papua New Guinea. *The Journal of Anthropology* 6(2):109-132.

1988 Primary Health Care: A Papua New Guinea Example. *Cultural Survival Quarterly* 12(1):1-4.

1988 (with A. F. Afdhal) The Rise of the Modern Jamu Industry in Indonesia: A Preliminary Overview. In: S. van der Geest & S. R. White, eds., *The Context of Medicines in Developing Countries: Studies in Pharmaceutical Anthropology*, pp. 149-172. Dordrecht: Kluwer Academic Publishers.

1990 (with J. Terrell) Return to New Guinea. *In the Field: The Bulletin of the Field Museum of Natural History* 61(5):1, 10-11.

1990 (with J. Terrell) Trade Networks, Areal Integration, and Diversity along the north Coast of New Guinea. *Asian Perspectives* 29:156-165.

DEPARTMENT OF ANTHROPOLOGY
1992

INTERNS

Renata Alves, Graduate Student, University of Illinois at Chicago
South American archaeology research assistance

Trudy Barrie, Northeastern Illinois University
Analysis of A. B. Lewis Project materials on cultural diversity along the North Coast

Mavis Blacker, Undergraduate Student, Native American Education Center
Assembled archival and computer data related to requirements of federal repatriation legislation

Karrie Brace, Graduate Student, Northern Illinois University
Inventory of Maya material in FMNH collections

Elizabeth Bradley, Undergraduate Student, School of the Art Institute of Chicago
Peruvian textile catalogue

Justine Buck, Undergraduate Student, University of Chicago
Developed guidelines for an educational curriculum concerning teaching of Native Americans and worked on repatriation project

Melanie Drake, Post-Senior Anthropology Student, Grinnell College
Developed guidelines for an educational curriculum concerning teaching of Native Americans

Howard Eisenberg, Post-Senior Anthropology Student, University of Wisconsin
Analysis of A. B. Lewis Project materials on cultural diversity along the North Coast

Patty Gibbons, Undergraduate Student, University of Chicago
Analysis of artifacts from Northern Rio Grande Research Project

Ian Gordon, Undergraduate Student, University of Chicago
Analyzed Jemez black on white pottery from Seshukwa

Patricia Hamlen, Graduate Student, Northern Illinois University
Research on Northern Rio Grande Research project ceramics for thesis

Mary Allison Haynie, Graduate Student, University of Kansas
Cataloguing

David Kice, Graduate Student, University of Chicago
Worked on project to develop standardized guidelines for recording human skeletal material

David Lomelino, Graduate Student, University of Illinois at Chicago
South American archaeology research assistance

Jane Forrest McCarron, Graduate Student, University of Illinois at Chicago
South American archaeology research assistance

Martina Nehrling, Undergraduate Student, School of the Art Institute of Chicago
Repatriation

Melanie Okamoto, Undergraduate Student, University of Chicago
Researched on images Japanese folklore.

Patricia Poleski, Undergraduate Student, De Paul University
Assembled archival and computer data related to requirements of federal repatriation legislation

Gabrielle S. Powell, Undergraduate Student, School of the Art Institute of Chicago
South American archaeology research assistance

Ellen Quinn, Graduate Student, University of Illinois at Chicago
South American archaeology research assistance

James Reynolds, Undergraduate Student, Westminster College
Developed small finds organization for final site report

Larry Saviers, Undergraduate Student, Northwestern University
Analysis of A. B. Lewis Project materials on cultural diversity along the North Coast

William Scott, Undergraduate Student, Indiana University
Analyzed Jemez black on white pottery from Seshukwa, and, assisted in upgrading storage of specimens through fabrication of archival mounts; undertook physical inventories of specimens

Jane Sliva, Graduate Student, University of Illinois at Chicago
Research on lithics at Pueblo Blanco and San Marcos for M.A. paper

Judith Lane Straszewski, Undergraduate Student, School of the Art Institute of Chicago
Assisted in upgrading storage of specimens through fabrication of archival mounts; undertook physical inventories of specimens

Suzanne Szucs, MFA Candidate, School of the Art Institute of Chicago
Assisted in upgrading storage of specimens through fabrication of archival mounts; undertook physical inventories of specimens

Helen Tsiapas, Undergraduate Student, Loyola University
Research on and for Chinese exhibit labels.

Jo Ann Tan, Undergraduate Student, School of the Art Institute of Chicago
Assisted in upgrading storage of specimens through fabrication of archival mounts; undertook physical inventories of specimens

Susana Zubiate, Advanced Intern, National Endowment for the Arts
Conservation of Indian and Melanesian objects

DEPARTMENT OF ANTHROPOLOGY
1992

RESEARCH ASSOCIATES, FIELD ASSOCIATES, ASSOCIATES

Associates

Eloise Richards Barter, M.A.
North American Ethnography

Dorothy Baumgarten, A.A.
Asian Material Culture

Louva Calhoun, B.F.A.
Anthropology

Sol Century, B.S.
Asian Material Culture

William J. Conklin, M.A.
Peruvian Architecture and Textiles

Connie Crane, A.B.
North American Ethnology

Patricia Dodson, M.A.
Latin American Archaeology and Ethnology

Jane Levin, B.S.
North American Archaeology

Elena Kourembana Lincoln, M.A.
Mayan Archaeology

Carolyn Moore, B.A.
Asian Material Culture

Charles R. Ortloff, M.Ae.E.
Peruvian Archaeology

Col. Millard E. Rada, E.E.
Museology

Llois Stein
Oceanic Material Culture

Research Associates

Dean E. Arnold, Ph.D.
Mesoamerican and South American Archaeology and Ethnology

Philip J. Arnold III, Ph.D.
Mesoamerican Archaeology, Craft Production, and Ethnoarchaeology

Brian Bauer, Ph.D.
Andean Archaeology

Robert J. Braidwood, Ph.D.
Middle Eastern Archaeology

James A. Brown, Ph.D.
North American Archaeology

Patrick H. Carmichael, Ph.D.
South American Archaeology and Ethnology

Phillip J.C. Dark, Ph.D.
African Ethnology

Jack L. Davis, Ph.D.
Mediterranean Archaeology

Richard De Puma, Ph.D.
Etruscan Archaeology

Robert Feldman, Ph.D.
Andean Archaeology

Paul S. Goldstein, Ph.D.
South American Archaeology

Robert L. Hall, Ph.D.
Plains and Midwestern Archaeology and Ethnology

Chuimei Ho, Ph.D.
East and Southeast Asian Archaeology and Art History

Paul Hockings, Ph.D.
Southern Asian Social Anthropology

Bill Holm, M.F.A
Northwest Coast Art and Material Culture

F. Clark Howell, Ph.D.
Old World Prehistory

Lawrence H. Keeley, Ph.D.
Europe and North American Paleolithic Archaeology

Maxine Kleindienst, Ph.D.
Old World Prehistory

Alan L. Kolata, Ph.D.
Andean Archaeology and Ethnohistory

Lyle Konigsberg, Ph.D.
Physical Anthropology

Charles E. Lincoln, Ph.D.
Mesoamerican Archaeology

Michael E. Moseley, Ph.D.
South American Archaeology

Douglas W. Owsley, Ph.D.
Physical Anthropology

James L. Phillips, Ph.D.
Old World Prehistory, Epipaleolithic Typology and Technology

Robert B. Pickering, Ph.D.
Physical Anthropology

Jack H. Prost, Ph.D.
Physical Anthropology and Primate Behavior

George I. Quimby, M.A.
Museology and North American Culture History

David Reese, Ph.D.
Archaeozoology and Paleomalacology

Johan G. Reinhard, Ph.D.
Nepal, Bolivia, and Peru

Mario A. Rivera, Ph.D
South American Archaeology

Fred H. Smith, Ph.D.
Physical Anthropology

Gil J. Stein, Ph.D.
Middle Eastern Archaeology, Complex Societies

Robin Torrence, Ph.D.
Aegean and Pacific Archaeology and Ethnohistory

Patricia Wattenmaker, Ph.D.
Middle Eastern Archaeology

Ronald L. Weber, Ph.D.
Amazon Basin and Northwest Coast Archaeology and Ethnology

DEPARTMENT OF ANTHROPOLOGY
1992

VISITING SCIENTISTS AND CURATORS

Kathleen Barlow, University of Minnesota
Preliminary work for exhibition of Lower Sepik River material culture

Patrick Carmichael, Professor, Calgary University, and Research Associate, FMNH
Research Kroeber Nazca manuscript

Julie Cormack, Graduate Student, University of Liverpool
Study Isimila Prehistory collection and documentation

Dr. Raymond DeMallie, Professor, Indiana University
Research Pawnee collections and related documentation

Wim De Wit, Curator, Chicago Historical Society
World Columbian Exposition objects and related documentation

Michael Diehl, Graduate Student, School of American Research
Research Paul Martin field notes

Rebecca Green, Graduate Student, Indiana University
Study of Madagascan textiles

Juliette Graver, Graduate Student, Indiana University
Study of Classical jewelry

Pat Hamlin, Graduate Student, Northern Illinois University
Work on graduate project utilizing Northern Rio Grande material

Hennie Hoang, Post-Doctoral Associate, University of Minnesota
Study Korean collections and related documentation

Jason Baird Jackson, Graduate Student, Indiana University
Assisted Dr. Raymond DeMallie in research on Pawnee collections and related documentation

David Lipset, Associate Professor, University of Minnesota
Preliminary work for exhibition of Lower Sepik River material culture

Dr. Edward Shields, Professor, Dentistry Centre for Human Genetics - McGill University
Study skeletal material from Papua New Guinea and Africa

DEPARTMENT OF ANTHROPOLOGY
1992

PUBLICATIONS

Bennet Bronson

1992. The Early Southeast Asian Metals Trade. In Ian Glover ed., *Early Metallurgy, Trade and Urbanism in Thailand and Southeast Asia*, pp. 110-146. Bangkok, White Lotus Press.

1992. (with Joyce C. White) Radiocarbon and Chronology in Southeast Asia. In Robert Ehrich ed., *Radiocarbon and Chronology in the Old World*, 3rd ed., vol. 1: 491-504 & vol. 2: 475-515. Chicago, University of Chicago Press.

1992. REVIEW. Janice Stargardt, "The Ancient Pyu of Burma," vol. 1. *Journal of Southeast Asian Studies* 23(2):435-438.

Winfred Creamer

1992. Regional Exchange Along the Pacific Coast of Costa Rica, During the Late Polychrome Period, A.D. 1200-1550. *Journal of Field Archaeology* 19:1-16.

1992. (with Jonathan Haas) Demography of the Protohistoric Pueblos of the Northern Rio Grande, A.D. 1450-1680. In *Current Research on the Late Prehistory and Early History of New Mexico*, Bradley J. Vierra, ed. New Mexico Archaeological Council.

Robert Feldman

1992. Preceramic Architectural and Subsistence Traditions. *Andean Past*, 3:67-86.

1992. REVIEW. Terence Grieder, et al., La Galgada: A Preceramic Culture in Transition. In *American Antiquity* 57(2):375-376.

Jonathan Haas

1992. The Causes of War. *In the Field: The Bulletin of the Field Museum of Natural History.* Mar/Apr 1992.

1992. (with James B. Stoltman and James H. Burton) Chemical and Petrographic Characterizations of Ceramic Pastes: Two perspectives on a Single Data Set. In *Chemical Characterization of Ceramic Pastes in Archaeology*, edited by Hector Neff. Prehistory Press.

1992. (with Thomas Boyd) The Native American Graves Protection and Repatriation Act: Prospects for New Partnerships between Museums and Native American Groups. *Arizona State Law Journal* 24(1): 253-282.

1992. (with Winifred Creamer) Demography of the Protohistoric Pueblos of the Northern Rio Grande, A.D. 1450-1680. In *Current Research on the Late Prehistory and Early History of New Mexico*, Bradley J. Vierra, ed. New Mexico Archaeological Council.

Chuimei Ho

1992. The Archaeology of the Kok Charoen Area, in I. Glover ed. *Early Metallurgy, Trade and Urbanism in Thailand and Southeast Asia.* Bangkok, White Lotus Press.

1992. Western Science in the East -- 18th Century Glass in China. *In the Field: The Bulletin of the Field Museum of Natural History*, March/April, p. 11.

1992. Trade and Manufacture: Guangdong Ceramics in the Late Tang Period. In *Journal of Trade Ceramic Studies*, 12:159-179, Fukuoka (translated in Japanese).

Janice Klein

1992. Book Review. Post-Medieval Archaeology in Britain. *Albion*, 24, 1, Spring 1992.

David Reese

1992. Recent and Fossil Invertebrates (with a Note on the Nature of the MH I fauna). Appendix I in W.A. McDonald and N.C. Wilkie, eds., *Excavations at Nichoria in Southwest Greece II The Bronze Age Occupation.* Minneapolis, University of Minnesota Press. Pp. 770-778.

1992. Animal Bones. Chapter II.25 in R. Leighton, *The Cittadella in the Protohistoric Period* (Morgantina Studies 3). Princeton, Princeton University Press. Pp. 91-95.

1992. Shells and Animal Bones from the Amathus Tombs. In V. Karageorhis, O. Picard and C. Tytgat, eds., *La Nécopole d'Amothonte Tombes 113-367* VI. Nicosia.

1992. Shells from the 1986 Season. Chapter 14 in B. MacDonald, *The Southern Ghors and Northeast 'Arabah Archaeological Survey.* Sheffield Archaeological Monographs 5. J.R. Collis Publications, Department of Archaeology and Prehistory, Sheffield, University of Sheffield, Pp. 155-156.

1992. Recent and Fossil Marine Invertebrates. Appendix 2 in H. Sackett, et al., *Knossos, From Greek City to Roman Colony. Excavations at the Unexplored Mansion* II. British School of Archaeology at Athens Suppl. vol. 21. Oxford, Alden Press. Pp. 493-496.

1992. Tale of the pygmy hippo. *Cyprus View* 6 (July), pp. 50-53.

Anna Roosevelt

1992. Arqueologia Amazonica. In *Historia dos Indios no Brasil*, ed. Manuela Carneiro da Cunha. São Paulo: Companhia das Letras: Secretaria Municipal de Cultura.

1992. Sociedades prehistoricas no Amazonas Brasiliero. In *Nos vesperos do mundo moderno: Brazil e Africa*, edited by Jill Diaz. 2 vols. Lisbon: Comissao Nacional para as Comemoracoes dos Descobrimentos Portugueses. Vol. 1, pp. 17-45.

1992. Secrets of the forest: An archaeologist reappraises the past -- and future -- of Amazonia. *The Sciences* November/December. Pp. 22-28. New York: New York Academy of Sciences.

Catherine Sease

1992. *A Conservation Manual for the Field Archaeologist*, Archaeological Research Tools Series No. 4. Second Edition. Institute of Archaeology, University of California, Los Angeles.

1992. REVIEW. Olga Krzyszkowska, Ivory and Related Materials: An Illustrated Guide. In *Collection Forum*, vol. 8, no. 1, p. 35.

1992. REVIEW. Olga Krzyszkowska, Ivory and Related Materials: An Illustrated Guide, and Edgard O. Espinoza and Mary-Jacque Mann,

Identification Guide for Ivory and Ivory Substitutes. In *Journal of the American Institute for Conservation*, vol. 31, no. 2, pp. 261-263.

Charles Stanish
1992. *Ancient Andean Political Economy*. Austin, Texas, University of Texas Press.

John Terrell
1992. Language and Culture on the North Coast of New Guinea (with R. L. Welsch and J. N. Nadolski). *American Anthropologist* 94(3): 568-600

James VanStone
1992. (with Charles V. Lucier) The Traditional Oil Lamp Among Kangigmiut and Neighboring Inupiat of Kotzebue Sound, Alaska. *Arctic Anthropology*, vol. 28, no. 2, pp. 1-14.

1992. (with Charles V. Lucier) Winter and Spring Fast Ice Seal Hunting by Kangigmiut and other Inupiat of Kotzebue Sound, Alaska. *Etudes/Inuit/Studies*, vol. 15, no. 1, pp. 29-49.

1992. (with Charles V. Lucier) Historic Pottery of the Kotzebue Sound Inupiat. *Fieldiana:Anthropology*, new series, no. 18.

1992. The Russian Fur Trade in Southwest Alaska. Pp. 296-304 in *Bering and Chirikov: The American Voyages and their Impact*, edited by O.W. Frost. Alaska Historical Society.

1992. Material Culture of the Blackfoot (Blood) Indians of Southern Alberta. *Fieldiana:Anthropology*, new series, no. 19.

Robert Welsch
1992. Language and Culture on the North Coast of New Guinea (with J. E. Terrell and J. N. Nadolski). *American Anthropologist* 94(3): 568-600

1992. REVIEW. Children of AFEK: Tradition and Change Among the Mountain Ok of Central New Guinea. B. Craig and D. Hyndman, eds., *American Anthropologist* 94(2):494-495.

DEPARTMENT OF ANTHROPOLOGY
1992

CURRENT ACTIVE GRANTS

Bennet Bronson

Upgrade of the Anthropological Storage Facilities. National Endowment for the Humanities. $783,310. July 1992 - June 1997. Co-PIs - Jonathan Haas and Catherine Sease.

Christine Gross

Care and Maintenance of North American Ethnographic Textiles, Garments, and Tipi Models. National Endowment for the Arts. $16,200. April 1991 - March 1992.

Jonathan Haas

Upgrade of the Anthropological Storage Facilities. National Endowment for the Humanities. $783,310. July 1992 - June 1997. Co-PIs - Bennet Bronson and Catherine Sease.

Support for the Primate Facility at Field Museum of Natural History, National Science Foundation, Co-PIs - Bruce Patterson and Jack Fooden. $25,537.

Illinois Cooperative Work/Study Program, The University of Chicago. $15,750.

Anna Roosevelt

The Development Sequence at Santarem on the Lower Amazon, Brazil. National Endowment for the Humanities. 1991 - 1993.

John D. and Catherine T. MacArthur Foundation Prize Fellowship. $265,000. September 1988 - August 1992.

Catherine Sease

Upgrade of the Anthropological Storage Facilities. National Endowment for the Humanities. $783,310. July 1992 - June 1997. Co-PIs - Bennet Bronson and Jonathan Haas.

Post-graduate Internship Program in the Conservation of Ethnographic Works of Art. National Endowment for the Arts. $20,000. May 1992 - November 1993.

Charles Stanish

Prehispanic State Formation in the Lupaqa Area, Peru. National Science Foundation. $41,405. August 1990 - January 1992.

John Terrell

Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea. National Endowment for the Humanities. $69,950. August 1991 - July 1993. Co-PI - Robert Welsch.

Exchange Networks on the North Coast of New Guinea: Collaborative Field Studies and Historical Research Using American and German Museum Collections. National Science Foundation. $71,836. August 1992 - January 1994. Co-PI - Robert Welsch.

Robert Welsch

Continuity and Change in Exchange Relations on the Aitape Coast of Papua New Guinea. National Endowment for the Humanities. $69,950. August 1991 - July 1993. Co-PI - John Terrell.

Exchange Networks on the North Coast of New Guinea: Collaborative Field Studies and Historical Research Using American and German Museum Collections. National Science Foundation. $71,836. August 1992 - January 1994. Co-PI - John Terrell.

TOTAL AWARDS **$1,308,988.00**

DEPARTMENT OF ANTHROPOLOGY
1992

SCIENTIFIC TRAVEL

Catherine Anderson
New York, NY — 12/08-10/92
Museological Information - American Museum of Natural History, National Museum of the American Indian

Bennet Bronson
China — 09/28 - 10/15/92
Fieldwork

San Francisco, CA — 12/02-04/92
Annual Meeting - American Anthropological Association

Winfred Creamer
Pittsburgh, PA — 04/08-10/92
Annual Meeting - Society for American Archaeology

Santa Fe, NM — 06/18 - 08/19/92
Archaeological field work at site of Pueblo Blanco

San Francisco, CA — 12/04-06/92
Annual Meeting - American Anthropological Association

Washington, DC — 12/08-10/92
New World Archaeology Panel - National Endowment for the Humanities

Christine Del Re
Ottawa, Ontario, Canada — 05/25-31/92
Annual Meeting - International Institute for Conservation-Canadian Group

Buffalo, NY — 06/01-07/92
Annual Meeting - American Institute for Conservation

Mochlos, Siteia, Crete 06/27 - 08/02/92
Fieldwork

William Grewe-Mullins
Baltimore, MD 04/24-29/92
Annual Meeting - American Association of Museums

Christine Gross
Madrid, Spain 05/07-14/92
Annual Meeting - Society for Preservation of Natural History Specimens

Miami, FL 09/15-18/92
Annual Meeting - American Association for State and Local History

New York, NY 12/08-10/92
Museological Information - American Museum of Natural History, National Museum of the American Indian

Jonathan Haas
Chicago, IL 03/26/92
Lecturer - American Law Institute - American Bar Association Committee on Continuing Professional Education

Baltimore, MD 04/25-29/92
Annual Meeting - American Association of Museums

Seville, Spain 05/07-15/92
Visit to New World Archives

Santa Fe, NM 07/02 - 08/18/92
Archaeological field work at site of Pueblo Blanco

San Francisco, CA 12/01-07/92
Annual Meeting - American Anthropological Association

Janice Klein
Des Plaines, IL 03/21/92
Workshop - Northeastern Illinois Historical Council

Chicago, IL 03/22-24/92
Management Workshop - Project Success Through Problem Solving

Chicago, IL 03/25-27/92
ALI-ABA Course of Study: Legal Problems of Museum Administration

Baltimore, MD 04/24-29/92
Annual Meeting - American Association of Museums

Elmhurst, IL 05/14/92
Meeting - Chicago Area Registrars Council

Milwaukee, WI 09/30 - 10/02/92
Annual Meeting - Midwest Museums Conference

Karen Poulson
Milwaukee, WI 10/01/92
Annual Meeting - Midwest Museums Conference

Anna Roosevelt
Chicago, IL 02/09-11/92
Annual Meeting - American Academy of Arts and Sciences

New York, NY 02/18-21/92
Lecture and Meeting - Rainforest Alliance

Urbana, IL 02/28/92
Meeting - Midwest Archaeology

Washington DC 03/11-13/92
Research Meetings - National Endowment for the Humanities

Madison, WI 04/01-06/92
Lectures

Kansas City, MO 04/05-06/92
Lecture - American Sociological Society

Pittsburgh, PA 04/08-10/92
Annual Meeting - Society for American Archaeology

Denver, CO 04/28/92
Lecture - Denver Museum of Natural History

New York, NY 05/18/92
Seminar - Wenner-Gren Foundation for Anthropological Research

New York, NY 05/18-19/92
Board of Trustees Meeting - Rainforest Alliance

New York, NY 05/20/92
Lecture - New York Botanical Garden

Para, Brazil 06/22 - 08/21/92
Fieldwork

Belem, Brazil 07/01/92
Lecture - Museu Paraense Emilio Goeldi

Monte Alegre, Brazil 08/01/92
Lecture

New York, NY 09/10/92
Board of Trustees Meeting - Rainforest Alliance

Boston, MA 09/10/92
Conferral of Honorary Degree - Northeastern University

Boston, MA 10/05/92
Executive Committee Meeting - Latin American Scholarship Program in American Universities, Harvard University

Boston 10/14/92
Induction - American Academy of Arts and Sciences

New York, NY 10/23-24/92
Advisory Council Meeting - Wenner Gren Foundation for Anthropological Research

Manaus, Brazil 11/07-16/92
Public Lecture - International Conference on Quarternary of Amazonia

New York, NY 11/17/92
Board of Trustees Meeting - Rainforest Alliance

San Francisco, CA Annual Meeting - American Archaeological Association	12/02-04/92
Catherine Sease	
Santa Fe, NM Annual Meeting - Western Association of Art Conservators	09/26 - 10/03/92
Charles Stanish	
Madison, WI Lecture	02/21/92
Decatur, IL Lecture - Miliken University	03/92
Washington DC International Monetary Conference	03/30 - 04/03/92
Pittsburgh, PA Annual Meeting - Society for American Archaeology	04/08-10/92
Peru/Bolivia Fieldwork	06/17 - 08/14/92
Evanston, IL Lecture - Northwestern University	09/92
Chicago, IL Lecture - University of Chicago	10/92
Aurora, IL Lecture - Aurora University	10/92
John Terrell	
Madison, WI Lecture	02/07/92
New Orleans, LA Meeting - Association for Social Anthropology in Oceania	02/19-23/92

San Francisco, CA 12/02-04/92
Annual Meeting - American Anthropological Association

James VanStone
Calgary, Alberta, Canada 02/16/92
Lecture - Glenbow Museum

Evanston, IL 02/19/92
Lecture - Mitchell Museum

Fairbanks, AK 03/26-30/92
Annual Meeting - Alaska Anthropological Association

Bloomington, IN 10/92
Lectures - Indiana University

Robert Welsch
Papua New Guinea 01/17 - 02/01/92
Field Museum Tour - Leader

New York, NY and Boston, MA 06/01-05/92
Library Research - New York Public Library, Union Theological Library, Harvard University Library

Hanover, NH 09/21 - 10/06/92
Hood Museum, Dartmouth College - Consultant to museum concerning the Harry Franklin Collection of New Guinea art

San Francisco, CA 12/01-03/92
Annual Meeting - American Anthropological Association

DEPARTMENT OF ANTHROPOLOGY
1992

VOLUNTEERS

Dee Aiani
Trudy Barrie
Dorothy Baumgarten
Garland Brown
Sol Century
Peter Coey
James Coplan
Connie Crane
Liz Dabich
Molly Donovan
Paul DuBrow
Jack Ewing
Melina Gallo
Peter Gayford
Patricia Gibbons
Margaret Goes
Laura Good
Ian Gordon
Robert Gowland
Tom Grygiel
Steven Isaac
Belen Jaquez
Melissa Krier
Shannon Lalor
Rebecca Lauer
Betty Lewis
Valerie Lewis
Jack MacDonald
Melissa Martens
Carolyn Moore
George Morse
Dorothea Phipps-Cruz
Julie Pitzen
Timothy Rehusch
Jim Reynolds
Anthony Rieck
Kathryn Saliba
Maria Theresa Sanford
Robin Shoaps
Ika Tomaschewsky
Julius Wagman
Wong Wangfai
Edward Yastrow
Kathy Zygman

DEPARTMENT OF ANTHROPOLOGY
1992

COLLECTIONS SIZE

Continent, Region, Subject	Count of Items Subtotal	Total
Africa		
Sub-Saharan, History-Ethnography		
Cameroon, Nigeria & West	5400	
Benin bronzes (104)		
Angola & Zaire	850	
East & South	3780	
Total Sub-Saharan		10030
Madagascar, History-Ethnography		3770
Egypt, Archaeology		3490
Coptic textiles (670)		
General, Prehistoric Archaeology		141940
General & Other, Hist-Ethnography		1600
TOTAL AFRICA		**160830**
Europe		
Italy, Archaeology		
Etruscan	280	
Roman & Graeco-Roman	1080	
Pompeii finds (200)		
Total Italy		1360
Other, Archaeology & Hist-Ethnog.		120
General, Prehistoric Archaeology		45700
TOTAL EUROPE		**47180**

Asia		
East, Archaeology & Hist-Ethnog.		
China	23500	
Rubbings (5000+)		
Textiles (3000)		
Tibet	4400	
Japan	4690	
Sword furniture (1060)		
Other (Korea, Siberia, etc.)	700	
Total East Asia		33290
Southeast, History-Ethnography		
Philippines	9150	
Indonesia-Malaysia	6460	
Mainland	370	
Burma (240)		
Thailand (130)		
Total Southeast Asia		15980
South, Archaeology & Hist-Ethnog.		
India, Nepal, Bangladesh	2420	
Sri Lanka	430	
Pakistan & Afghanistan	810	
Total South Asia		3660
Middle East		
General, Ethnography	100	
Iran & Jordan, Archaeology	300	
Iraq, Archaeology	31500	
Total Middle East		31900
Other (Central, West)		100
TOTAL ASIA		**84930**
South America		
Andean Area, Archaeology		16900
Andean Area, Hist-Ethnog.		680
Amazonia & Marginal, Hist-Ethnog.		5410
General, History-Ethnography		50
TOTAL S. AMERICA		**23040**

Central & Middle America	
Mainland, Archaeology	10600
Mainland, History-Ethnography	2720
Caribbean, History-Ethnography	950
TOTAL C. & M. AMERICA	**14270**
North America	
Arctic, History-Ethnography	4800
Northwest Coast, History-Ethnog.	6950
California, History-Ethnography	4350
Plains & Basin, History-Ethnog.	15030
Southwest, History-Ethnography	5560
East & Central, History-Ethnog.	3180
General, History-Ethnography	150
Southwest & Central, Archaeology	185000
TOTAL N. AMERICA	**225020**
Pacific	
Australia, History-Ethnography	1560
New Guinea, History-Ethnography	14950
Melanesia, History-Ethnography	14900
Polynesia, History-Ethnography	5190
Micronesia, Arch. & Hist-Ethnog.	11270
General, History-Ethnography	100
TOTAL PACIFIC	**47970**
Osteological	
General	**4750**
TOTAL COLLECTION	**607,990**

DEPARTMENT OF ANTHROPOLOGY
1992

USE OF COLLECTIONS BY LOAN

Number of Loans	Specimens Loaned	Specimens Borrowed
26	726	17

SCHOLARLY USE OF COLLECTIONS BY VISITORS

Number of Professionals	Number of Students	Number of Others
148	56	94

FIELD MUSEUM OF NATURAL HISTORY

COMPUTING, LIBRARY, PHOTOGRAPHY AND SCIENTIFIC SUPPORT SERVICES

1992

ANNUAL REPORT TO THE BOARD OF TRUSTEES

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COMPUTING, LIBRARY, PHOTOGRAPHY

AND SCIENTIFIC SUPPORT SERVICES

1992

Computing Services Staff (CCUC)

James W. Koeppl, Ph.D. ..... Computer Systems Manager (on leave)
Peter E. Lowther, Ph.D. ..... Computer Systems Specialist, Acting Computer Manager
Wen-Lii Liu, M.S. ..... Computer Systems Assistant
Gregory Kotulski, B.S. ..... Computer Systems Specialist
Dahoa Wang, M.S. ..... Computer Systems Specialist
Lorraine Deveaux, B.S. ..... Computer System Specialist
Paul Aikonedo ..... Secretary

Library Staff (CEEB)

W. Peyton Fawcett, B.A. ..... Librarian
Benjamin Williams, M.A. ..... Associate Librarian; Librarian, Special Collections
Michele Calhoun, M.S.L.S. ..... Librarian, Reference and Public Service
Chih-wei Pan, M.S. ..... Librarian, Cataloging
Roger Buelow ..... Manager, Publications Sales
Sarah Bridger ..... Library Assistant, Circulation and Collection Inventory
Janeen Devine, B.A. ..... Library Assistant/Interlibrary Loans
Kenneth Grabowski, M.S. ..... Library Assistant, Technical Processing
Michael Trombley, M.F.A. ..... Library Assistant, Cataloging and Resource Centers

Photography Staff (CCUC)

John Weinstein, B.F.A. ..... Head Photographer
Nina Cummings, B.A. ..... Photo Researcher
James Balodimas, B.A. ..... Photographer
Diane Alexander White, B.A. ..... Photographer
Linda Dorman, B.A. ..... Darkroom Technician
Cassandra Redhed ..... Department Clerk

Scientific Support Services Staff

Scientific Illustration (CEEB)

John J. Engel, Ph.D. ..... Supervisor, Scientific Illustrators
Zbigniew Jastrzebski, M.F.A. ..... Senior/Scientific Illustrator
Zorica Dabich, B.F.A. ..... Scientific Illustrator
Marlene Hill Donnelly, B.S., A.A. ..... Scientific Illustrator
Clara Richardson Simpson, M.S. ..... Scientific Illustrator

Scanning Electron Microscope (CEEB)

Betty Strack, M.S. ..... SEM/Technician

Biochemistry Laboratories (CEEB)

John G. Hall, Ph.D. ..... Manager/Biochemical Laboratories
Jeannette Briggs ..... Lab Research Technician

Field Museum Press (CEEB)

Harold K. Voris, Ph.D. ..... Scientific Editor, Field Museum Press
Majorie Pannell ..... Editorial Coordinator/Field Museum Press

Scholarship Committee (CEEB)

Lance Grande, Ph.D. ..... Chairman, Scholarship Committee
Pamela Pettis, B.A. ..... Secretary, Scholarship Committee

COMPUTING

Computing Services is charged with supporting diverse computing activities at Field Museum. During 1992, staff activities were involved in all areas of the Museum. Computing hardware used to support Collections & Research activities consists of a DEC VAX 11/785, running UNIX 5.3 operating system. C/Base is the commercial database software used for all centralized database applications. C/Base provides a menu driven interface to access a variety of screens, reports and editing functions.

Many of the collections management applications in Collections & Research are in maintenance mode with only minor adjustments and additions being made (e.g., Mammals, Birds, Amphibians and Reptiles, Insects, Geology, Anthropology and Botany). Many of the features of these existing applications were brought together as the design for a database application for Invertebrates to support their application for a collections management grant.

Application for use at Rice Resource Center was developed and added to the "In the Wild" Nature Area database application already in place in exhibits.

We have continued to support the hardware and software applications in use by Personnel (C/Base application on UNIX networked PC), Finance (Timeline software on VAX 3100 under VMS); Museum Store (POS software on UNIX PC) began upgrade of hardware and software; Visitor Services register system (ADS system on Novell Network); and Development and Membership (Raiser's Edge on VAX 3100 as fileserver). Computing also provides first line of general hardware and software support for Personal Computers in building.

Professional activities of Peter Lowther:

Peter E. Lowther became editor for Inland Bird Banding Association and works with production of North American Bird Bander, published jointly by Inland BBA, Western BBA and Eastern BBA.

Meetings: Attended 110th Stated Meeting of American Ornithologists' Union at Ames, Iowa, 24 June 1992 - 27 June 1992.

Attended Annual Meeting of Inland Bird Banding Association at Moline, Illinois, 31 October 1992 - 1 November 1992.

Publications:

Lowther, P. E. 1992. Breeding Bird Censuses: Tallgrass prairie I, II, and III. J. Field Ornithol. 63(Suppl.):103-104.

Lowther, P. E., and C. L. Cink. 1992. House Sparrow. In: The Birds of North America, No. 12 (A. Poole, P. Stettenheim, and F. Gill, Eds). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

COMPUTING SPECIAL UPDATE

The Project Status of the Consortium of Free Standing Museums of Natural History and Botanical Gardens

For the past year James Koeppl has been on leave from his position as Computer Systems Manager to participate full time in a National Science Foundation sponsored project entitled "The Assessment of the Needs of Free-Standing Museums for the Computerization of Collections Management and Related Research." Official participating institutions include American Museum of Natural History, Academy of Natural Sciences, Bernice P. Bishop Museum, California Academy of Sciences, Carnegie Museum, Natural History Museum of Los Angeles County, Missouri Botanical Garden, New York Botanical Garden; Field Museum of Natural History and National Museum of Natural History are unofficial participants. Dr. Koeppl is the Project's Coordinator acting as a technical and contractual consultant responsible for coordinating the activities of the member institutions and MITRE, the computer engineering firm hired to conduct the study. The goal of the project is to survey each institution's existing computer resources, determine common needs for research and collections management and make recommendations that not only improve computer resources at each institution, but also improve the potential for information sharing among the institutions. The project is scheduled to conclude in May of this year with the publication of MITRE's report.

FIELD MUSEUM LIBRARY

Field Museum Library maintains and builds collections of books, journals and other special materials that are essential to the Museum's research, exhibition, and educational programs. The Library serves a number of different publics, each with distinctive needs, and strives to balance the requirements of all users in order to provide the best possible service. In addition to the services provided to Museum staff, volunteers, interns, visiting scientists, specialists and consultants, Library collections are available to the international community of natural science researchers through the Interlibrary Loan Program. Library resources are also offered to the public at large through the Library's Public Reading Room.

The escalation in the cost of scientific journals that began in the early 1980's continues unabated. Research libraries nationwide are reporting that they are making substantial cuts in funding for serials acquisition. At Field Museum Library, selective cancellations of costly journals each year since 1984 have finally controlled the growth of serials expenditures. Additional titles have been targeted for cancellation to keep costs within funding levels without further depleting book purchase funds, which have been already partially devoured by serials costs.

Due to the loss of one staff position and extended absences of key personnel during 1992, the Library is unable to provide detailed reporting of acquisition and collection use for 1992. Approximately 1,000 books were acquired through purchase, exchange and gift and 1,050 volumes of journals were received through the Library's 3,100 current serial titles.

The Friends of Field Museum Library made many contributions to the Library during the year and through the Friends Fund added the following significant works to the Rare Books Collections:

Robert Kaye Greville (1794-1866) published his Scottish cryptogamic flora in monthly parts from 1823 to 1827. The completed work consists of six volumes containing 360 finely colored plates depicting the fungi of Scotland and reproducing Greville's own original paintings.

Born in Germany, Peter Simon Pallas (1741-1811) was invited to work at St. Petersburg Academy of Science in 1767, and spent the next forty years guiding the development of Russian science. A versatile scientist and an observational genius, Pallas made many important contributions to the natural sciences. Evident in his Travels through the southern provinces of the Russian empire in the years 1793 and 1794 (London, 1802-1803) are the results of his comparative method, through which he sought to go beyond simple description to the identification of causal interrelationships and hidden regularities in natural phenomena.

A student and friend of Conrad Gesner, Jean Bauhin (1541-1613) was a tireless collector of plants and founder of botanic gardens at Montbeliard and Stuttgart. He left unpublished at his death the virtually complete manuscript of his Historia plantarum universalis which was finally published by others in three folio volumes in 1650-1651, thirty-seven years after his death. This great work contained descriptions and synonyms of 5226 plants, nearly twice the number of any previously published work, and included not only European but some Eastern and American species as well.

Library Volunteers

John Craib-Cox, Elizabeth Dilworth, Arden Frederick, Robert Gowland, Mabel Johnson
China Oughton, Christopher Quinn, James Reed, Marie Rosenthal, Worthington Smith

Library Service

Michele Calhoun, Editorial Board, Library-Anthropology Resource Group

Library Reading Room Statistics

In person Inquiries	1,674
Telephone Inquiries	639
Letter Inquiries	24
Total Reading Room Inquiries	**2,337**
Visitors to Reading Room	754
Items Located for Visitors	6,600

PHOTOGRAPHY

The Photography Department provides a full range of photographic services to the entire Field Museum staff including the Center for Cultural Understanding and Change, The Center for Evolutionary and Environmental Biology, Public Programs, Development and External Affairs, and Finance and Museum Services. The Department also makes its services and collection available to a diverse group of scholars, educational and research institutions, governmental granting agencies, scientific publishers, and commercial publishers.

The Department is responsible for new photography, lab services, and for maintaining the Photography Collection. The Collection is in charge of cataloguing, preserving, and researching negatives, prints, slides, and transparencies. It currently holds over 500,000 images, and grows annually by an estimated 15,000. The collection at FMNH contains the only comprehensive visual documentation of our scientific collections, field work, and the history of the museum. Photographs in the Collection range from the earliest field expeditions to the most current SEM photographic images. These images are produced by photographers in the Department, and by curators, researchers, and others. The lab processing services provide for film processing, printing, copying and duplicating. Staff photographers produce new photography of artifacts and specimens in the studio, and photograph events, exhibits, activities, staff portraits, and the building and grounds. Uses include scientific research publications, slides to illustrate lectures, promotional and marketing publications, news and editorial publications, and exhibit display and preparation.

In-house requests:

The department serviced 1,118 in-house job requests in 1992. Overall production of new photography, lab services, and photo research remained high, with our in-house black-and-white services again the major area of production. **A total of 16,773 black-and-white prints were ordered, with over 10,000 of them being made in-house.** Our photographers worked on many assignments for FMNH curators and researchers, including on-going work for Lance Grande, Associate Curator of Fossil Fishes in the Geology Department. This project requires a detailed photographic study of both fossil and living species of ray-finned fishes.

Another project begun in 1992 was to produce hundreds of new studio photographs of groupings of artifacts from Papau New Guinea, which are part of the A.B. Lewis collection. Work for this project also included printing hundreds of the glass plate negatives shot in the field between 1909-1913 by A.B. Lewis. This work is for a 1993-1994 publication by Robert Welsh, Visiting Associate Curator, A.B. Lewis Research Project, in the Anthropology Department.

Dr. James Vanstone, also of the Anthropology Department will be publishing photographs of Ainu visitors to the Louisiana Purchase Exposition of 1904.

Dr. Patrick Carmichael, University of Calgary in collaboration with curator emeritus Donald Collier will be publishing the research work of A.L. Kroebers' expedition to Peru, illustrated with over 50 photographs by Kroeber taken in the 1920s.

Through the Anthropology Department, prints from the Collection were sent to Andrew Joseph of the Colville Confederated Tribes Museum, Washington; Burton Pretty-On-Top, for his research on the Crow Tribe; The Commonwealth of Northern Marianas Islands and curators Jonathan Haas, Charles Stanish and John Terrell also requested photographs from the Collection for their publications and research.

The Development and Geology Departments obtained photography for use as gifts to donors. FMNH President Sandy Boyd made an address to the Board of Trustees which was illustrated with a large selection of historical and contemporary photos from the Collection. In late 1992, work began on the

Centennial of the Museum, including "Images In Motion," a project organized by Mrs. Charles F. Nadler and Mrs. Michael Bilandic of the Womens' Board. "Images in Motion" will turn the Museums' north facade into a giant projection screen for moving images. This display will be presented during the 1993-1994 celebration at selected times.

A project for Lucy Bukowski in the Finance office was completed for the Museums' Accreditation Self-Study. This process is completed approximately once every decade in order for the Museum to receive accreditation by the American Association of Museums. We produced an album, complete with captions, with 70 8x10 black-and-white prints showing many aspects of the Museum.

In addition to these assignments, over three thousand prints were made in-house for the Botany Department's Type Photo Collection, and several thousand others were requested by various FMNH curators and researchers.

Progress photography of new permanent exhibits included Messages from the Wilderness, Africa, Life Over Time, and Ruatepupuke II: A Maori Meeting House, as well as a variety of hall closings and deinstallations. These photos are used for grant reports, exhibit display and preparation, lectures, and for historical documentation.

As part of the Africa exhibit project, Staff Photographer James Balodimas traveled to Senegal along with other members of the exhibit team. His work is being used both for exhibit display, and for research and reference.

Promotional photography for the Public Relations Department included travel by Head Photographer, John Weinstein, to The Witte Museum in San Antonio, Texas, to photograph the traveling exhibit Backyard Monsters, prior to its installation here. These photographs were used to publicize the FMNH exhibit through a major press kit, and were also used as reference by FMNH Exhibit Design and Production, Visitor Services, Museum Store and Special Events, and others.

Over 12,000 color slide duplicates and black-and-white prints were produced for Public Relations uses in publicizing permanent, temporary, and traveling exhibits, as well as lectures, performances, and demonstrations. New photographs of the mammal dioramas in the Messages from the Wilderness and animal mounts in the Into the Wild exhibit were published in the FMNH calendar which is distributed to FMNH Members and Staff, and through our Womens' Board at their Gala Ball. These and other promotional photographs of the Messages from the Wilderness exhibit were used in press kits and releases sent to over 1,800 media contacts nationally and internationally.

Other notable in-house publications included:

- Perspectives: 1992, a report to donors published by the Development Department, using color and black-and-white photography in a very high quality designed and printed piece.

- An addition to the Centennial Collection of books, a volume entitled Egypt, was published. This is a companion to the exhibit Inside Ancient Egypt, and the book includes over 30 recent and historical photographs from the Collection.

- Work for the semi-monthly publication In The Field, which is sent to F.M. Members is a regular user of our photography.

- For this year's Members' Night a booklet entitled Out Of The Wild was published by the Membership Department. It was comprised of 29 historical photographs with captions, from the Collection.

Outside Requests:

The Department of Photography draws upon the vast resources of the Collection of negatives and transparencies to provide information and images to a variety of outside sources. **The total income generated from the sales of slides, prints, and permissions this year was $22,183.00.**

In 1992, 463 requests were received from 220 publishers such as: World Book Encyclopedia, Scientific American Books, Harry N. Abrams Inc, and American Indian Art Magazine. Museums made up 76 of these requests, and they came from institutions as near as the Chicago Historical Society, Art Institute and Museum of Science and Industry; and as far away as the Coal Museum in Shanghai, China. The Chicago museums requested photographs of the Field Columbian Museum and the World's Fair of 1893 in preparation for exhibits relating to the 100th anniversary of the Fair. The Coal Museum will be making a life-sized color photograph of our Carboniferous Forest Diorama which will be displayed in their museum. Requests also came from 45 universities, colleges and schools; 14 film and video producers; 17 outside requests came via the FMNH Webber Resource Center. We produced additional income through the service of 7 requests received for photography to be used in commercial advertising. Other requests were from individuals and non-profit institutions.

Highlighted items include:

- The American Museum of Natural History in New York is also renovating their "dinosaur" hall and has selected five photographs of Field Museums' Charles R. Knight Prehistoric murals depicting fossil vertebrates.

- Microsoft, a leader in computer software, used our photo of the painted portrait of Shawnee Chief "Tecumseh" in their CD-ROM Encyclopedia.

- The Carboniferous Forest dioramas' photograph will be used by a small, private, software programmer in her software on Plate Tectonics.

- Arkios Productions used four b/w photographs from the Greene archeological collection of photographs showing the southwest United States for "Archaeology" a new television series on cable.

- This Country Canada magazine obtained a photo of a southern Kwakiutl Dance Costume for possible inclusion in their premier issue, for Canada's 125th anniversary.

- Crystal Productions, an educational publisher, obtained slides of masks for use in a video portraying masks from different cultures, "Masks and Headdresses".

- Grolier Publishing Company is using several Charles R. Knight mural photographs in their "Wildlife Adventure Series" cards; Gannett Productions, "How The West Was Lost," documentary series on Discovery Channel, airing in 1993.

- Insignia Films, Ken Burns, executive producer, "The West," a ten-hour documentary for National Broadcast in 1996.

We request complimentary copies of books, magazines, videos and other items that include Field Museum photographs, and add these the Departments' library.

Highlights of the publications and videos received in 1992:

Honu Project, Hawaii. Video, *Fall of the Ancients: Hawaii's Green Sea Turtles in Crisis.*"

Kurtis Productions, Chicago. Video, *The New Explorers: Fragments of Time.*

Architecture and Planning of Graham, Probst and White 1912-1936: Transforming Tradition. University of Chicago Press, Sally A. Kitt Chappell, author.

Acoma and Laguna Pottery, School of American Research Press. Rick Dillingham, et al.

Dal Tigri All'Eufrate I. Sumeri E Accadi II. Babilonesi E Assiri. Antonio Invernizzi.

Visions of the People, exhibit catalogue for Minneapolis Institute of Arts.

PHOTOGRAPHY DEPARTMENT
1992 STATISTICS OF PRODUCTION

	Number of Jobs	B&W Roll Film	B&W Sheets Film	B&W Prints	Color Roll Film	Color Sheet Film	Color Prints	Color Dupe Slides
CENTER FOR CULTURAL UNDERSTANDING AND CHANGE:								
Anthropology	88	137	384	1332	102	131	38	2748
Conservation	39	35	20	302	37	0	0	125
Photography	44	2	23	207	22	31	98	32
Computing	5	1	0	12	0	0	0	0
VP Museum Affairs/C.C.U.C.	3	4	0	66	5	0	0	21
TOTAL	**179**	**179**	**427**	**1919**	**166**	**162**	**136**	**2926**
CENTER FOR EVOLUTIONARY AND ENVIRONMENTAL BIOLOGY:								
Botany	88	9	260	3022	15	0	32	20
Geology	180	52	395	1212	123	71	92	280
Zoology	134	52	115	1182	163	0	592	635
Biochem Lab	1	1	0	72	0	0	0	0
TOTAL	**403**	**114**	**770**	**5488**	**301**	**71**	**716**	**935**
PUBLIC PROGRAMS:								
Program Development	78	28	10	314	67	27	154	200
Design & Production	150	85	36	461	89	100	269	297
Education	48	34	1	508	26	0	174	0
Visitor Services	4	0	0	11	0	3	8	0
VP Public Programs	2	3	0	5	0	0	0	0
TOTAL	**282**	**150**	**47**	**1299**	**182**	**130**	**605**	**497**
DEVELOPMENT AND EXTERNAL AFFAIRS:								
Museum President's Office	16	11	20	213	18	0	3	57
Membership	13	11	8	204	6	20	95	0
Public Relations	98	32	88	7024	111	50	56	5621
Women's Board	38	11	83	115	15	202	532	0
Publications	39	20	54	225	5	21	1	6
Development	29	14	4	115	4	56	49	0
Tours	1	1	0	24	0	0	0	0
TOTAL	**234**	**100**	**257**	**7920**	**159**	**349**	**736**	**5684**
FINANCE AND MUSEUM SERVICES:								
Museum Store	3	0	0	6	0	69	0	0
Personnel	1	1	0	39	0	0	0	0
FPO	2	3	0	13	0	0	0	0
Housekeeping	6	6	0	46	0	0	0	0
Special Events	8	2	0	43	2	0	44	0
TOTAL	**20**	**12**	**0**	**147**	**2**	**69**	**44**	**0**
TOTAL QUANTITY PRODUCED BY AREA:								
C.C.U.C.	179	179	427	1919	166	162	136	2926
C.E.E.B.	403	114	770	5488	301	71	716	935
PUBLIC PROGRAMS	282	150	47	1299	182	130	605	497
DEVELOPMENT & EXT. AFFAIRS	234	100	257	7920	159	349	736	5684
FINANCE & MUSEUM SERVICES	20	12	0	147	2	69	44	0
GRAND TOTAL	**1118**	**555**	**1501**	**16773**	**810**	**781**	**2237**	**10042**
PERCENT OF USE BY AREA:								
MUSEUM AFFAIRS/C.C.U.C.	16%	32%	28%	11%	20%	21%	6%	29%
C.E.E.B.	36%	21%	51%	33%	37%	9%	32%	9%
PUBLIC PROGRAMS	25%	27%	3%	8%	22%	17%	27%	5%
DEVELOPMENT & EXT. AFFAIRS	21%	18%	17%	47%	20%	45%	33%	57%
FINANCE & MUSEUM SERVICES	2%	2%	0%	1%	0%	9%	2%	0%

*NOTE: STATISTICS DO NOT INCLUDE REQUESTS FROM OUTSIDE FIELD MUSEUM

SCIENTIFIC ILLUSTRATION

The four museum scientific illustrators are Zorica Dabich, Marlene Hill Donnelly, Zbigniew Jastrzebski, and Clara Richardson Simpson. Dr. John Engel supervises their activities. All of the illustrators are professional artists with a broad background in drawing and painting and many years of experience in both art and natural history illustration. They are charged with production of illustrations of various subjects, fulfilling the need for visual description of research material. The diversity of research interests of the curatorial staff is reflected in the wide variety of specimens and artifacts illustrated. Virtually all illustrations are produced from actual objects of scientific study, and include descriptive visual presentations, complicated reconstructions of artifacts, skeletal structures and fossil plants and animals. The illustrations are used as an explanatory supplement to the research conducted by the curatorial staff, and appear in various publications, including Fieldiana.

Each of the scientific illustrators employs a broad range of techniques and media, and works with a diversity of subjects. However, each illustrator has refined a particular technique. For example, water color paintings of South American monkeys and drawings of botanical subjects utilizing crow quill are the specialties of Zorica Dabich. Marlene Hill Donnelly excels in utilizing carbon dust, air brush, and scratch board techniques for the rendering of fossil and extant subjects. Clara Richardson Simpson excels in line and stipple representations of zoological and paleontological specimens. Zbigniew Jastrzebski has special expertise with pencil or pen and ink stipple rendering of skeletal structures as well as reconstructions of vessels for the anthropology staff.

Illustrators continue to utilize the new computer graphics system. The MacIntosh system assists the curators and Scientific Illustration staff in preparing high quality illustration, maps, tables, charts, etc for educational and publication purposes.

SCANNING ELECTRON MICROSCOPE

The Scanning Electron Microscope (SEM) facility is a multi-user research area composed of an AMRAY SEM and its ancillary equipment. The current SEM was purchased in 1989 with the support of the National Science Foundation and the Elizabeth F. Cheney Foundation to replace the out-of-date SEM that had serviced the facility for almost twenty years. The SEM has been an invaluable resource for both original research observations and documentation of results for the Botany, Geology and Zoology Departments. Scanning electron microscopy is particularly valuable for examining fine surface details of three-dimensional objects at magnifications ranging from 5x to over 20,000x. Some current research projects that utilize the SEM include: various studies of the structure and biology of fossil and living plants, investigations of the structure of jaws and teeth of small mammals, and examinations of meteorites. Other SEM research projects are the examinations of the morphology of beetles, bryozoans, fungi spores, octopus suckers and arm tips, snake scales, and snails. Twenty-nine curators, professional staff, students, research associates, and visiting scientists in the Center for Evolutionary and Environmental Biology have employed the SEM in their research in 1992. Researchers obtained over 1000 publishable SEM photographs. Storage of SEM observations by videotaping has also been explored.

Betty Strack, a part-time staff member, manages the SEM facility. Her duties include supervising the use of the SEM, maintaining detailed records of its use, and providing assistance to staff in their SEM research projects. Betty also keeps the facility in good operating condition which includes performing routine maintenance on instruments.

1992 Publication

Strack, B.A. EM facility, Field Museum of Natural History. In: Reports: Midwest EM laboratories addendum. Midwest Microscopy 21:10-11.

THE BIOCHEMISTRY LABORATORIES

During the last 20 years the biological sciences have experienced revolutionary technological growth, due in great part to major advances in biochemistry, protein chemistry, and molecular genetics. The consequences of these technological breakthroughs have now been felt not only in biology, but throughout society. Many of these techniques have important applications to many disciplines in Natural History--such as systematics--due to their capacity to elucidate the genetic characteristics of organisms.

In recognition of the Pritzker Foundation's unrestricted contribution to Field Museum's endowment, that is to be used initially to support the operation of the Biochemistry Laboratories, Scott M. Lanyon, Chairman of the Department of Zoology and Curator, Division of Birds, was appointed Pritzker Curator of Systematic Biology. Some typical situations in the study of Natural History where genetic information can be important are: i) in systematics, to infer genealogical relationships among a group of organisms to determine how species or populations might have descended from a common ancestor; ii) in biogeography, as in the determination of genetic relationships among groups of populations to draw inferences about historical patterns of migration and settlement; iii) in the determination of the evolutionary relationships of humans to other primates; iv) in endangered species propagation programs at zoological parks, where molecular techniques are often used to infer the genetic health of captive populations; and v) in the genetic characterization of extinct or endangered organisms from the genetic material still contained in dried skins and bone in museum collections.

Under Lanyon's direction, the Biochemistry Laboratories is continuing its development program to establish molecular biological techniques and procedures at the Field Museum as tools for research staff in their studies of long-standing problems in natural history. John G. Hall, Manager of the Biochemical Laboratories, coordinates the development and use of these facilities.

A major use of the current facilities is for the amplification and sequencing of specific genes or gene segments (DNA) from specimens in Field Museum collections. The capability to target a specific sequence of DNA in the genome, amplify it, and study its properties--is the result of the technological innovation known as the polymerase chain reaction (PCR). This PCR technology opens the door to the study of genes from organisms that were previously inaccessible to genetic study. It enables the characterization of individual genes from DNA extracted from small pieces of tissue, including dried skins, bone, tissues stored in alcohol, single hairs, and even single cells. The laboratories also possess capabilities for starch gel electrophoresis of proteins, a technique that has been used for over 25 years in biochemical systematics research. This technique provides useful information about genetic relationships among organisms from closely related populations and species and has continued to be employed by Field Museum staff in their work.

In 1992 the Biochemistry Laboratories produced DNA sequence data in association with the following projects.

i) In his study of blackbirds and other avian groups, Scott Lanyon has accumulated DNA sequence data from several genes of the mitochondrial genome, including the cytochrome b gene, the NADH dehydrogenase subunit genes 2 and 3, and the cytochrome oxidase subunit III gene. The total sequence determined to date in this project approaches 100,000 bases and was obtained from over 65 species of birds representing 40 genera and 7 families. The relationships inferred from these data have provided important insights into the evolution of several behavioral and ecological characteristics of these avifauna, such as the evolution of brood parasitism in the cowbirds.

ii) Sara Hoot, a post-doctoral research associate with Peter R. Crane (Geology) continues a major project to elucidate phylogenetic relationships among the flowering plants in the Ranunculidae, by

sequencing two genes (rbcL and atpB) from the chloroplast genome and an 18S ribosomal RNA gene from the nuclear genome. Dr. Hoot has obtained thousands of base pairs of sequence data for these genes from scores of taxa.

iii) relationships among the higher fungi inferred from sequences of nuclear ribosomal RNA genes (Gregory Mueller, Botany). Dr. Mueller obtained sequence data from the genus Laccaria and other members of the Agaricales with the help of two summer interns: Meilee Chen, an undergraduate from the University of Chicago, and Elizabeth Pine, an intern from the Illinois Mathematics and Science Academy. Ms. Pine won the Westinghouse Science Talent Search competition, largely on the strength of her work with Dr. Mueller.

iv) phylogenetic relationships among the Carnivora inferred from mitochondrial and nuclear DNA sequence data (John Flynn, Geology).

v) relationships among neotropical characiform fishes as inferred from mitochondrial DNA sequence data (Barry Chernoff, Zoology).

vi) several projects conducted by graduate students from the University of Chicago and the University of Illinois, Chicago, in collaboration with curators in the Divisions of Birds and Mammals, Department of Zoology.

As these research projects progress, the Biochemistry Laboratories also has goals i) to develop protocols to increase the efficiency, reliability, and economy of these technologies, ii) to adapt PCR and DNA sequencing techniques for the genetic analysis of preserved specimens in FMNH collections, and iii) to create more opportunities for the Field Museum scientific staff to use these techniques in their research.

FIELD MUSEUM PRESS

FIELDIANA PUBLICATIONS 1992

Anthropology

No. 18. Historic Pottery of the Kotzebue Sound Inupiat. By Charles V. Lucier and James W. VanStone; 1992. 26 pages, 20 illus. $10.00 (Publ. 1436).

No. 19. Material Culture of the Blackfoot (Blood) Indians of Southern Alberta. By James W. VanStone; 1992. 80 pages, 53 illus. $19.00 (Publ. 1439).

Botany

No. 29. PTERIDOPHYTA OF PERU. Part III. 16. Thelypteridaceae. By Rolla M. Tryon and Robert G. Stolze (with Alan R. Smith); 1992. 80 pages, 7 illus. $19.00 (Publ. 1433).

No. 30. Systematics of Laccaria (Agaricales) in the Continental United States and Canada ... By Gregory M. Mueller; 1992. 158 pages, 74 illus., 5 tables. $32.00 (Publ. 1435).

No. 31. The Ethnobotany of Southern Balochistan, Pakistan, with Particular Reference to Medicinal Plants. By Steven M. Goodman and Abdul Ghafoor; 1992. 84 pages, 18 illus. $20.00 (Publ. 1442).

Geology

No. 23. A Catalogue of Type Specimens of Fossil Fishes in the Field Museum of Natural History. By John Clay Bruner; 1992. 54 pages. $17.00 (Publ. 1431).

No. 24. The Ear Region in Xenarthrans (= Edentata: Mammalia). Part II. Pilosa (Sloths, Anteaters), Palaeanodonts, and a Miscellany. By Bryan Patterson, Walter Segall, William Turnbull, and Timothy J. Gaudin; 1992. 79 pages, 24 illus., 1 table. $20.00 (Publ. 1438).

No. 25. The Macropodoidea (Marsupialia) of the Early Pliocene Hamilton Local Fauna, Victoria, Australia. By Timothy F. Flannery, Thomas H. Rich, William D. Turnbull, and Ernest L. Lundelius, Jr.; 1992. 37 pages, 16 illus., 4 tables. $15.00 (Publ. 1443).

Zoology

No. 66. Mammals in the Royal Natural History Museum, Stockholm, Collected in Brazil and Bolivia by A. M. Olalla during 1934-1938. By Bruce D. Patterson; 1992. 42 pages, 18 illus. $15.00 (Publ. 1432).

No. 67. Current Classification and Family-Group Names in Staphyliniformia (Coleoptera). By Alfred F. Newton, Jr., and Margaret K. Thayer; 1992. 92 pages, 2 tables. $21.00 (Publ. 1434

No. 68. Studies on Skeleton Formation in Reptiles. III. Patterns of Ossification in the Skeleton of Lacerta vivipara Jacquin (Reptilia, Squamata). By Olivier Rieppel; 1992. 25 pages, 9 illus., 2 tables. $13.00 (Publ. 1437).

No. 69. A Key to the Bats of the Philippine Islands. By Nina R. Ingle and Lawrence R. Heaney; 1992. 44 pages, 60 illus., 5 tables. $14.00 (Publ. 1440).

No. 70. The South American Gracile Mouse Opposums, Genus Gracilinanus Gardner and Creighton, 1989 ... By Philip Hershkovitz; 1992. 56 pages, 20 illus., 7 tables. $17.00 (Publ. 1441).

SCHOLARSHIP COMMITTEE

The Field Museum supports the use of its collections and facilities by outside scholars and students. The Scholarship Committee is responsible for the review of applications and the disbursement of funds for visiting scientists, graduate fellows and undergraduate interns who wish to work with the Museum's collections or collaborate with its scientists. The Scholarship Committee administers seven separate funds. These include the Borg-Warner Visiting Scientist Fund, the Rowley Fund, the Schmidt Fund, the Thomas J. Dee Fellowship Fund, the Armour Fund, the Louer Fund, and the Undergraduate Internship Fund.

During the 1991-1992 period, the Scholarship Committee, chaired by Lance Grande, made awards to about 30 individuals in each of the four scientific departments. Of these awards, approximately 10 were given to exceptional graduate or undergraduate students who have demonstrated a strong commitment to the study of natural history. The remaining awards were given to scientists from around the world, including scholars from Russia, China, Czechoslovakia, Argentina, Jamaica, Madagascar, London, West Germany, Peru as well as numerous scientists from the United States and Canada.

Scholarships and Internships Awarded in 1992

Borg-Warner Robert O. Bass Visiting Scientists

(for the support of visiting scientists)

Dr. Myriam Ibarra
Dr. Donald Stewart
Jean-Claude Razafimahaimodison
Patrick Carmichael
Dr. Arthur Bogan
Dr. Anatoly Schieleyko
Dr. Jiri Vana
Victor Pacheco
Colin Patterson
Norbert Micklich

William A. and Stella M. Rowley Scholars

(for the education of worthwhile students in a field

related to the purposes of the Museum)

Scott Steppan

Karl P. Schmidt Scholars

(for the training of young scientists who desire
to study at the Field Museum)

Christopher W. Thompson

Thomas J. Dee Fellows

(for research and academic fellowships with priority given to younger, less well established research workers and to graduate students)

Stephen Donovan
John Wiens
Yining Luo
Edith Gomez-Sosa
Mario DeVivo
Floyd Hayes
Guo-Qing Li
Robert M. Lee, III
Dr. Mee-Man Chang

Lester Armour Family Graduate Fellows

(ensures the permanent support of at least one outstanding graduate student)

Brian Dyer

Internships

(work experience whereby an undergraduate or recent graduate gains hands-on training in his/her field of expertise for one or more semesters)

Howard Eisenberg
David T. Suhrbur
Elizabeth Pine
Daniel Adam Kluza
Jonathan Lilly
Helen Tsiapas
Michele Jones
Robert Kityo